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

12th GRUAN Implementation-Coordination Meeting (ICM-12)
Virtual
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Session 1

GRUAN Site Report for Singapore

(Submitted by Wong Shwei Lin)

Summary and Purpose of this Document

Report from the GRUAN site Singapore for the period January to December 2019.

Overview

Current dataflow to GRUAN LC:

- Twice-daily RS41-SG radiosonde soundings
- Monthly ECC ozonesonde soundings
- Hourly GNSS and meteo data files

Change and change management

NIL

Resourcing

NIL

Operations

Difficulties in regularly attaining the burst point at 10hPa during evening (12UTC) launch. At present, early bursting rate is about 10 to 20 % during evening.

Site assessment and certification

Radiosonde sounding program certified as of 13 May 2019.

GRUAN-related research

NIL

WG-GRUAN interface

Not at the moment

Items for ICM-12 plenary discussions

NIL

Other archiving centers

NIL

Participation in campaigns

NIL

Future plans

- Conduct test of efficacy of pre-heating of balloons and spraying of a thin flim of oil on the surface of balloon before each release.
- Monthly comparison launch between two different type of radiosondes (pending relevant authorities approval).

GRUAN Site Report for Singapore (SNG), 2019

Reported time range is Jan 2019 to Dec 2019
Created by the Lead Centre
Version from 2020-11-05

1 General GRUAN site information

Object	Value
Station name	Singapore
Unique GRUAN ID	SNG
Geographical position	1.3404 °N, 103.8880 °E, 21.0 m
Operated by	MSS | Meteorological Service Singapore, part of: NEA | National Enviroment Agency
Main contact	Lin, Wong Shwei
WMO no./name	48698 SINGAPORE/CHANGI AIRPORT
Operators	currently 8, changes +0 / -0
Sounding Site	1
GNSS	1

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
SNG-GN-01	GNSS site MSS1	GNSS	1	operational
SNG-RS-01	Singapore Radiosonde Launch Site	Sounding Site	4	707

1.2 General comments from Lead Centre

No comments from Lead Centre.

2 System: GNSS site MSS1 (SNG-GN-01)

Object	Value
System name	GNSS site MSS1
Unique GRUAN ID	SNG-GN-01
System type	GNSS (GN - GNSS)
Geographical position	1.2026 °N, 103.5316 °E, 36.1 m
Operated by	MSS | Meteorological Service Singapore, part of: NEA | National Enviroment Agency
Instrument contact	Lin, Wong Shwei
Started at	2017-04-17
Defined setups	1 (HOURLY)
Possible streams	-

2.1 Lead Centre comments

2.1.1 Dataflow

Measurements are recorded at station since April 2017.

Dataflow of GNSS data to GRUAN LC and the GRUAN GNSS processing centre at GFZ has started in February 2019. The current dataflow includes manufacturer raw data, converted raw data (RINEX) and instrument logs, containing all equipment changes.

The operational processing as GNSS-PW-GDP is performed.

3 System: Singapore Radiosonde Launch Site (SNG-RS-01)

Object	Value
System name	Singapore Radiosonde Launch Site
Unique GRUAN ID	SNG-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	1.3404 °N, 103.8880 °E, 23.5 m
Operated by	MSS | Meteorological Service Singapore, part of: NEA | National Enviroment Agency
Instrument contact	Lin, Wong Shwei
Started at	-
Defined setups	4 (ROUTINE2, ROUTINE, OZONE, OZONE2)
Possible streams	DFM-09, ECC, RS41

3.1 Lead Centre comments

3.1.1 Dataflow

Sonde dataflow to the GRUAN LC is operational since April 2016.

Dataflow includes twice daily soundings of Vaisala RS41-SG, monthly soundings of ECC Ozone sonde, and mothly soundings of Graw DFM-09. All soundings are submitted using RsLaunchClient.

3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI

3.2.1 Stream: DFM-09

DFM-09		4	4	
DFM-09-RAW	001		4	

3.2.2 Stream: ECC

ECC		7	7	

3.2.3 Stream: RS41

RS41		703	703	
RS41-GCA	001		687	
RS41-RAW	001		703	
RS41-EDT	001		698	
RS41-GDP-ALPHA	001		102	
RS41-GDP-ALPHA	002		552	
RS41-GDP-ALPHA	003		215	
RS41-GDP-BETA	001		234	

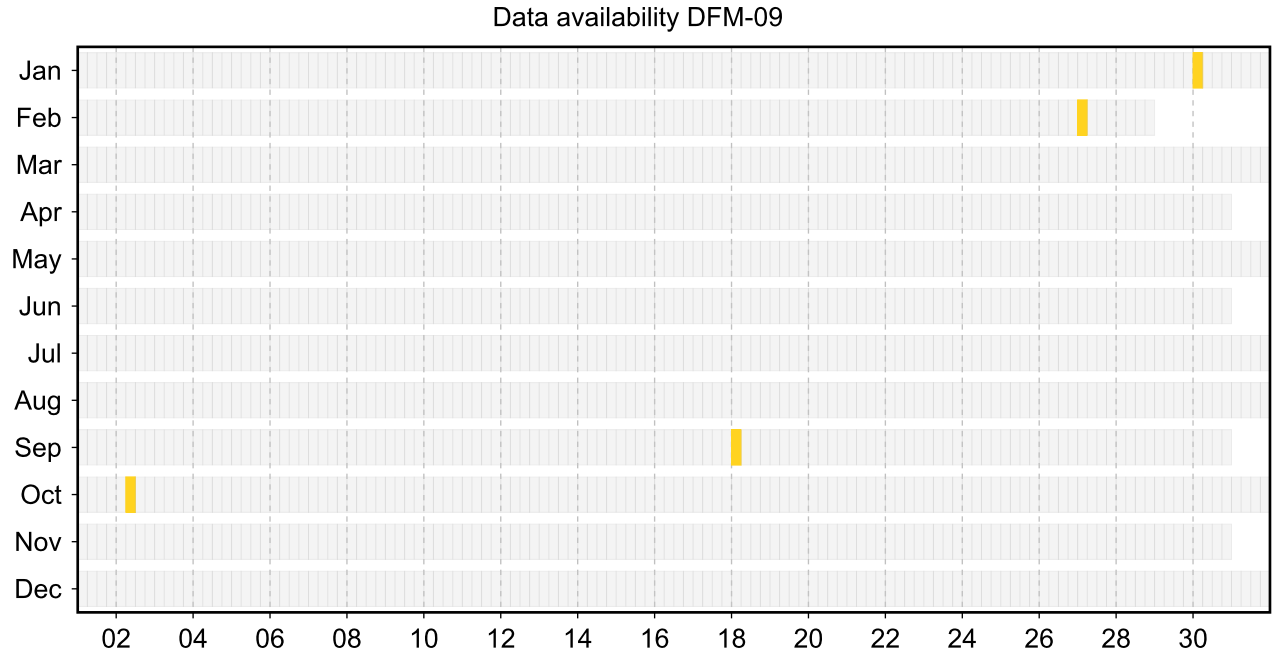
3.3 Availability of data products

Available (green): All steps of data processing have been successfully completed. The data product file is available at LC (e.g. files that didn't pass QA/QC or uncertified GRUAN data products) and/or at NCEI (a certified GRUAN data product file that did pass QA/QC).

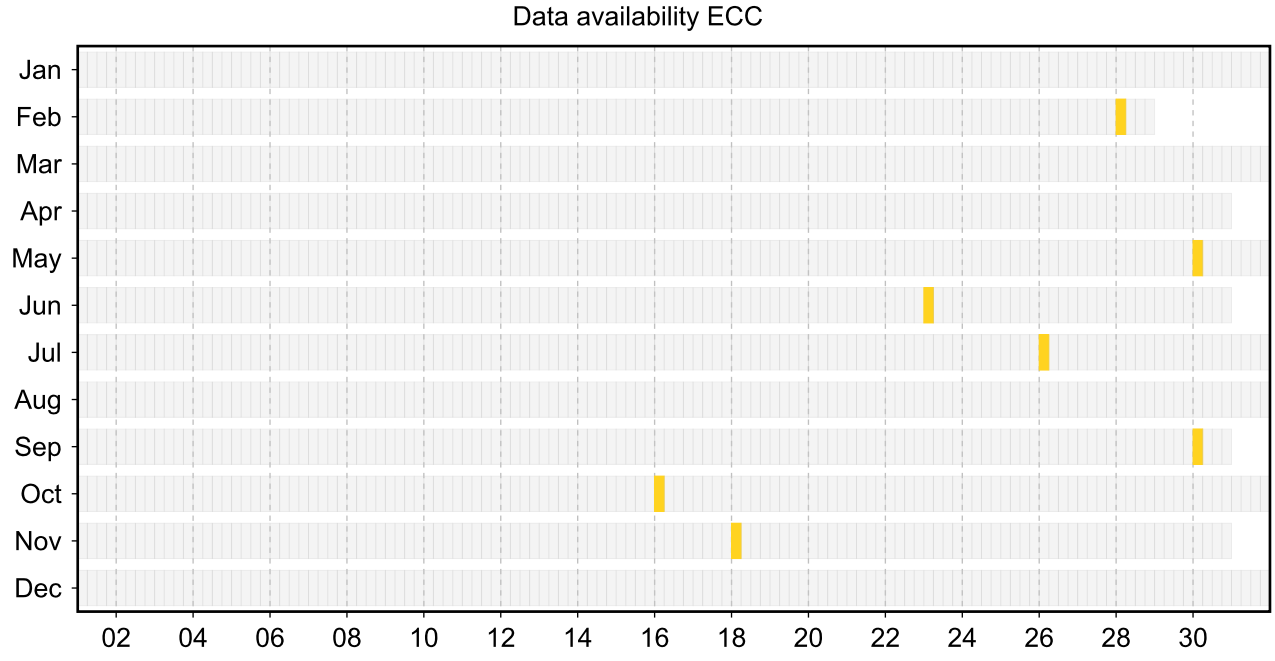
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software error.

Original (red): The original, manufacturer-produced, raw data file is available (e.g. MWX data file) but was not converted into a GRUAN-standardized raw data format (NetCDF). Reasons for this may be missing data conversion software, a software error, or a corrupt data file.

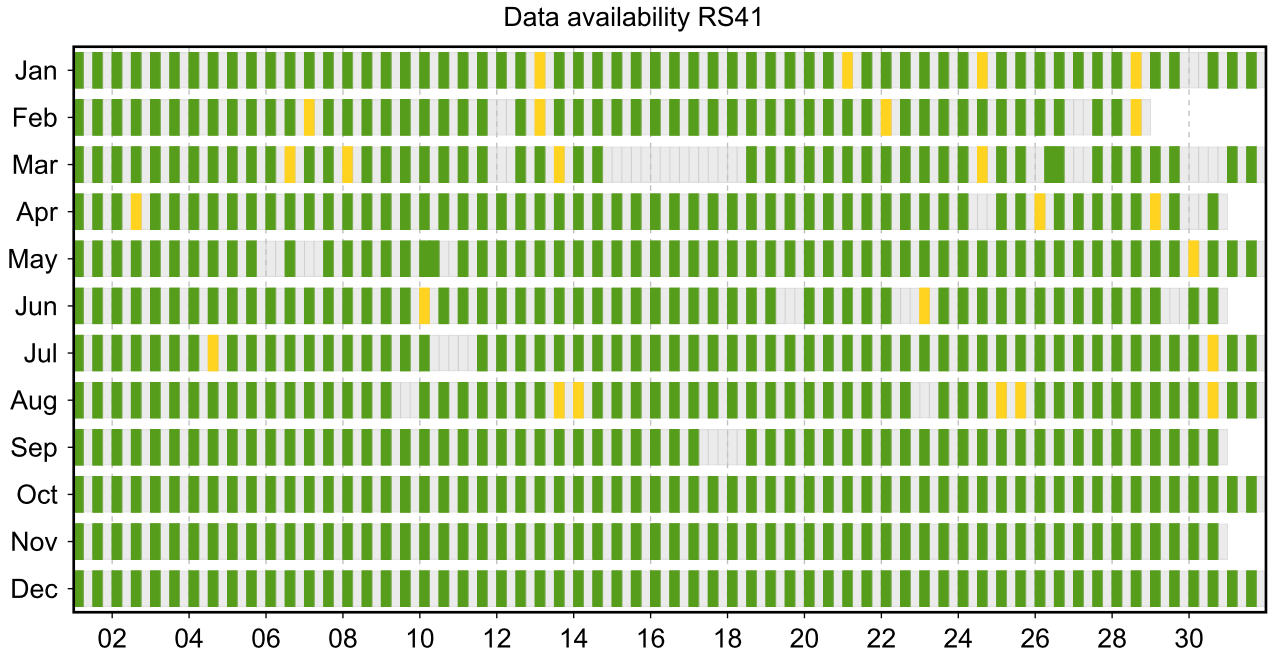
3.3.1 Stream: DFM-09



3.3.2 Stream: ECC



3.3.3 Stream: RS41



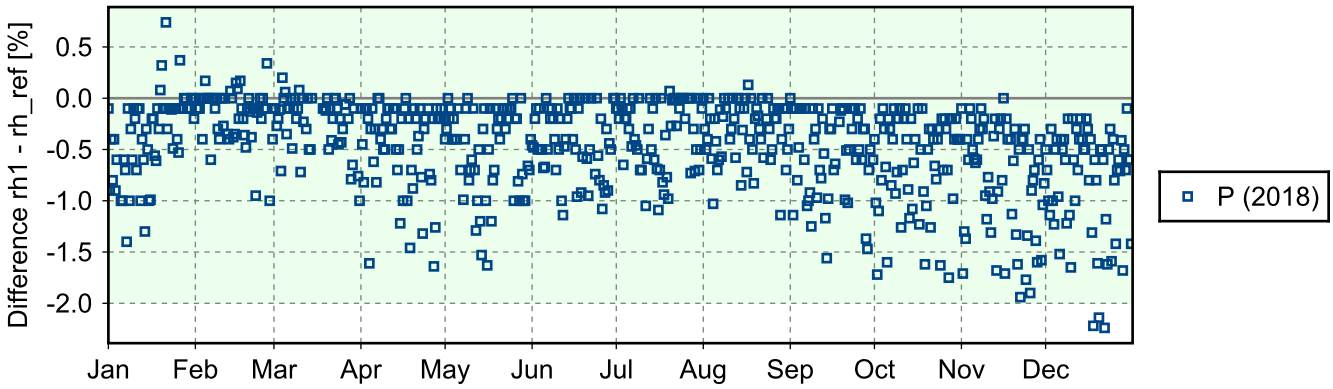
3.4 Instrument combinations of SNG-RS-01

Count	Instrument combination
4	DFM-09
7	ECC, RS41
696	RS41

3.5 Instrument ground check

3.5.1 Stream: RS41

(1) GroundCheck: GC-SHC



3.6 Measurement events