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GLOBAL CLIMATE OBSERVING
SYSTEM (GCOS)

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**12th GRUAN Implementation-
Coordination Meeting (ICM-12)**

Session 1

Virtual

16 - 20 November 2020

GRUAN Site Report for Barrow, Alaska

(Submitted by Evan Keeler)

Summary and Purpose of this Document

Report from the GRUAN site Barrow, Alaska for the period January to December 2019.

Overview

The ARM Northern Slope of Alaska (NSA) site near Barrow, Alaska operated one Vaisala AS15 Autolauncher and two Vaisala MW41 manual launch systems during 2019. The systems are designated C1, S01, and S02. NSA conducts 4 flights per day, launching at 00Z, 06Z, 12Z, and 18Z. The NSA site has a cooperative agreement with the National Weather Service (NWS). The 00Z and 12Z launch data are provided to the NWS for incorporation into their operational network. These flights are primarily conducted with the AS15 autolauncher system, however when the need arises for a dual flight the other systems will be used. All flight data is sent to the ARM Data Archive for processing and distribution.

Change and change management

No major changes have been made to how the NSA conducts operations since 2018. The site continues its normal operational launches described above. The site is continuing its support of the JPSS/RIVAL program. Phase 8 of the JPSS/RIVAL program continued through the end of 2019 with plans for phase 8 to end in 2020. Phase 9 will be started in 2020.

Resourcing

There are no resourcing issues to report at NSA. The NSA has installed a Hydrogen Generator managed by the NWS. This has been incorporated and approved for use in the Autosonde, eliminating the need for lifting gas deliveries to the remote site.

Operations

Operations at NSA have continued as normal in 2019. The site maintains the Autosonde for regular operations while performing supplemental launches to support research campaigns.

Site assessment and certification

The certification of the NSA site is pending GRUAN requirements for Autolauncher observations.

GRUAN-related research

In 2019 the NSA site continued its support of the following field campaigns with Lori Borg as the Principal Investigator for both:

- ARM: Radiosonde Intercomparison & VALidation (RIVAL)
 - <https://armweb0-stg.ornl.gov/research/campaigns/sgp2017rival>
- ARM Radiosondes for Joint Polar Satellite System (JPSS) Validation Field Campaign
 - <https://www.osti.gov/servlets/purl/1526023>

Support for both campaigns continued through 2019 at NSA. In 2020 funding will run out for phase 8 and phase 9 will begin.

WG-GRUAN interface

The primary interaction between ARM and the GURAN working group will be focused on expanding the capabilities of the SGP site.

Other archiving centers

ARM data is placed only in the ARM Data Archive.

<https://www.archive.arm.gov/discovery/>

Participation in campaigns

All ARM field campaign information is available on the ARM website at:

<https://www.arm.gov/research/campaigns>

Most supported field campaigns request radiosonde launches to support the targeted research.

Future plans

In 2020 Evan Keeler will be replacing Donna Holdridge as the radiosonde mentor. The NSA site will continue to support the JPSS and RIVAL radiosonde launches. The NSA will also continue the 4 operational launches per day.

ARM will continue to operate radiosonde launches in arctic locations in the MOSAIC campaign. The ARM Mobile Facility 2 (AMF2) will be aboard the Polarstern. AMF1 will be in Andøya Island, Norway, NSA in Utqiagvik, AK.

All Sonde computer systems will be upgraded to windows 10 in 2020. This will require all MW41 software to be updated to 2.16.

In 2020 plans will start to investigate upgrading the AS15 Autosonde to the AS41 Autosonde.



GRUAN Site Report for Barrow (BAR), 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	Barrow
Unique GRUAN ID	BAR
Geographical position	71.3233 °N, -156.6158 °W, 8.0 m
Operated by	ARM US DOE Atmospheric Radiation Measurement (ARM) Program
Main contact	Keeler, Evan
WMO no./name	70027 BARROW/POINT BARROW
Operators	currently 0, changes +0 / -0
Sounding Site	2
GNSS	1

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
BAR-GN-01	GNSS Site UTQI	GNSS	1	operational
BAR-RS-01	Balloon-Borne Sounding System (SONDE) at Barrow	Sounding Site	4	26
BAR-RS-02	Balloon-Borne Sounding System (SONDE) at Barrow	Sounding Site	3	1348

1.2 General comments from Lead Centre

1.2.1 General

ARM employs an automated procedure to transmit raw measurement data.

ARM is kindly requested to inform the Lead Centre of any (upcoming) changes in equipment, launch schedule, or procedures so that the metadata database can be kept up-to-date.

2 System: GNSS Site UTQI (BAR-GN-01)

Object	Value
System name	GNSS Site UTQI
Unique GRUAN ID	BAR-GN-01
System type	GNSS (GN - GNSS)
Geographical position	71.3229 °N, -156.6103 °W, 7.5 m
Operated by	ARM US DOE Atmospheric Radiation Measurement (ARM) Program
Instrument contact	Keeler, Evan
Started at	2017-07-28
Defined setups	1 (HOURLY)
Possible streams	-

2.1 Lead Centre comments

2.1.1 Dataflow

Dataflow of GNSS data to GRUAN LC and to the GRUAN GNSS processing centre at GFZ has started in July 2017. The current dataflow includes manufacturer raw data, converted raw data (RINEX), instrument logs, and processed data.

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

3 System: Balloon-Borne Sounding System (SONDE) at Barrow (BAR-RS-01)

Object	Value
System name	Balloon-Borne Sounding System (SONDE) at Barrow
Unique GRUAN ID	BAR-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	71.3233 °N, -156.6158 °W, 8.0 m
Operated by	ARM US DOE Atmospheric Radiation Measurement (ARM) Program
Instrument contact	Keeler, Evan
Started at	-
Defined setups	4 (ROUTINE, ROUTINE2, ROUTINE3, DUAL)
Possible streams	RS41, RS92

3.1 Lead Centre comments

3.1.1 General

This system is mainly used as back up in case there is a failure with the autolaunch system.

The ARM facility code is S01.

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		26	26	
RS41-RAW	001		26	
RS41-EDT	001		26	
RS41-GDP-ALPHA	002		23	
RS41-GDP-ALPHA	003		19	
RS41-GDP-BETA	001		19	

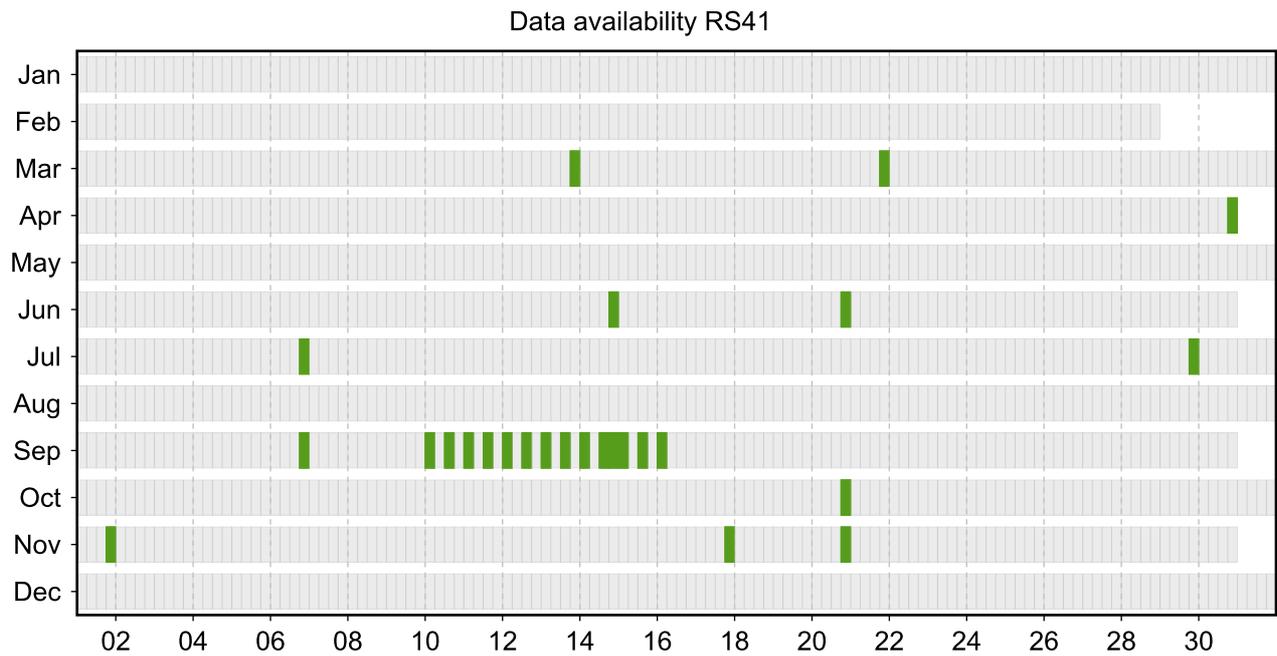
3.3 Availability of data products

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: RS41



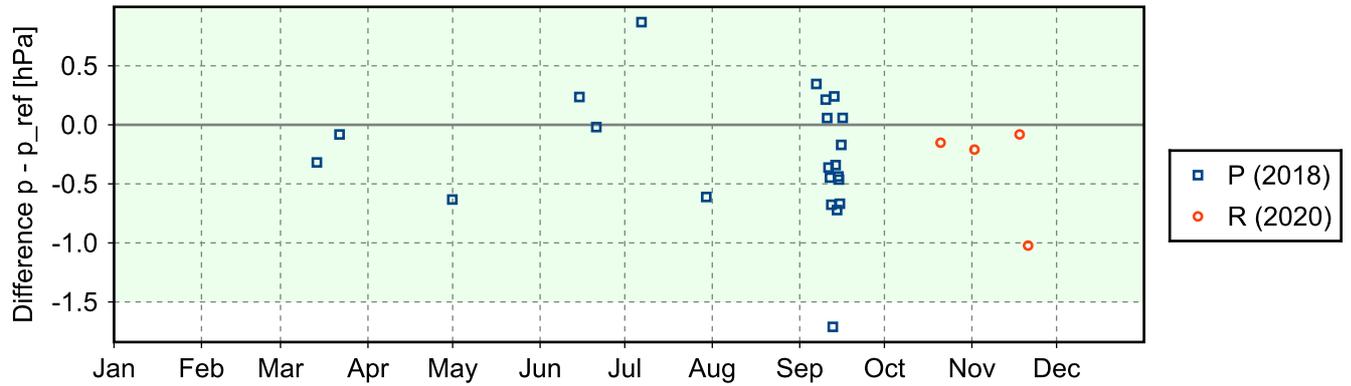
3.4 Instrument combinations of BAR-RS-01

Count	Instrument combination
26	RS41

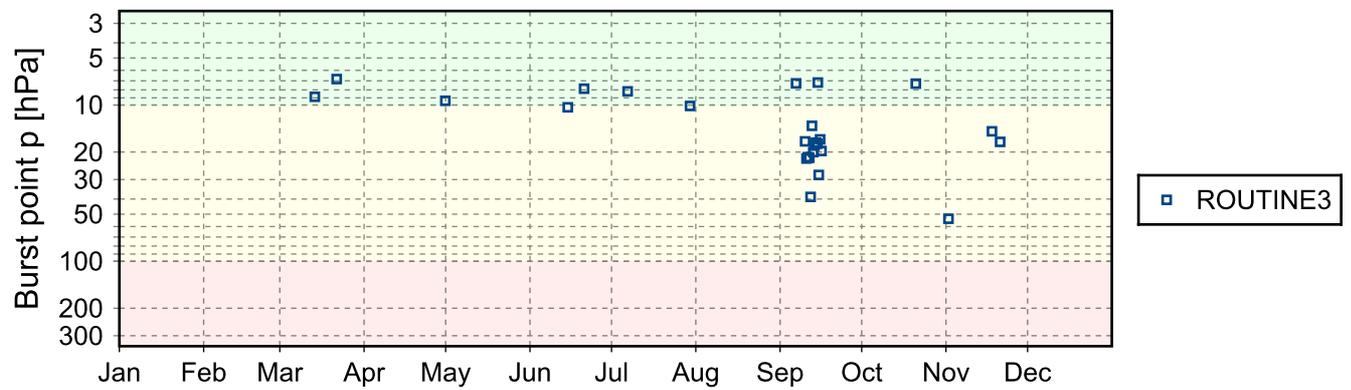
3.5 Instrument ground check

3.5.1 Stream: RS41

(1) GroundCheck: GC-RI41



3.6 Measurement events



4 System: Balloon-Borne Sounding System (SONDE) at Barrow (BAR-RS-02)

Object	Value
System name	Balloon-Borne Sounding System (SONDE) at Barrow
Unique GRUAN ID	BAR-RS-02
System type	Sounding Site (RS - Radiosonde)
Geographical position	71.3233 °N, -156.6158 °W, 8.0 m
Operated by	ARM US DOE Atmospheric Radiation Measurement (ARM) Program
Instrument contact	Keeler, Evan
Started at	2012-02-08
Defined setups	3 (AUTO1, AUTO2, AUTO3)
Possible streams	RS41, RS92

4.1 Lead Centre comments

4.1.1 Dataflow

Dataflow is running fully automated from the ARM Archive to the GRUAN LC. Launch metadata are not checked manually. Equipment changes (e.g. balloon, unwinder, ...) are not recorded.

As a consequence it is essential that the Lead Centre is notified of all upcoming changes to be able to maintain a correct metadata record. (This comment applies to all ARM sites in GRUAN.)

The current operational radiosonde is the Vaisala RS41.

The ARM facility code is C1.

RS92 data were not processed because of invalid data files.

4.2 GRUAN data products

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

RS41		1346	1346	
RS41-RAW	001		1346	
RS41-EDT	001		1309	
RS41-GDP-ALPHA	001		140	
RS41-GDP-ALPHA	002		1056	
RS41-GDP-ALPHA	003		439	
RS41-GDP-BETA	001		445	

4.2.2 Stream: RS92

RS92		2	2	
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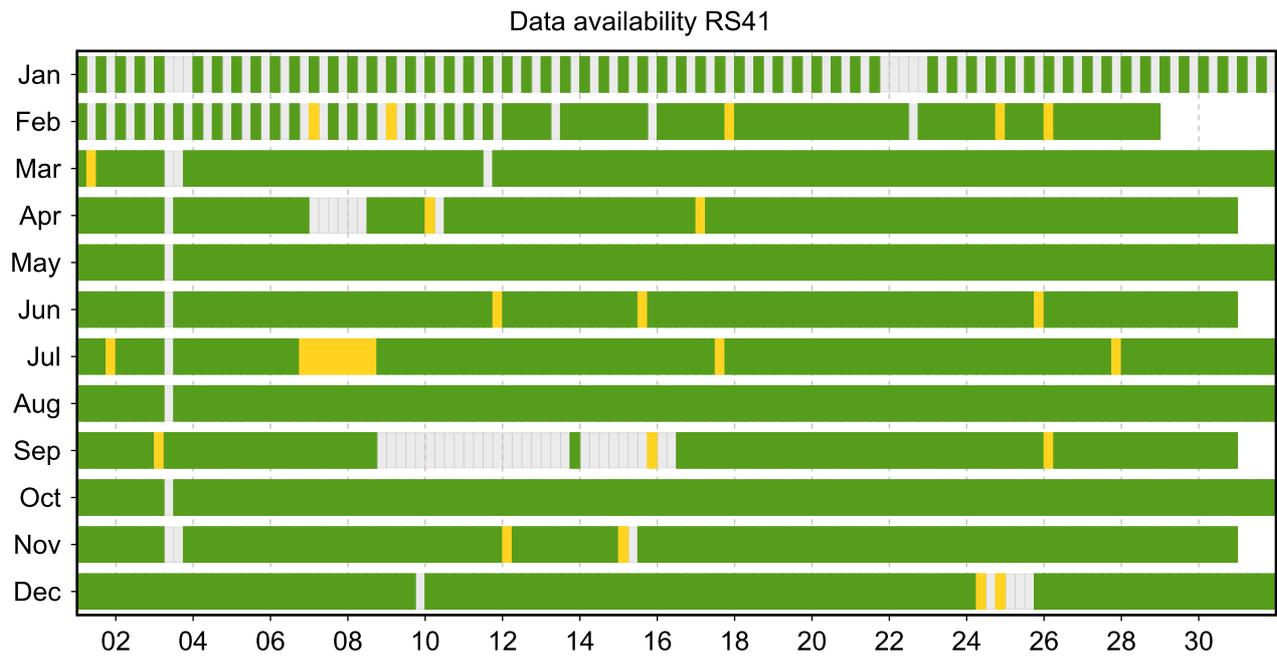
4.3 Availability of data products

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).

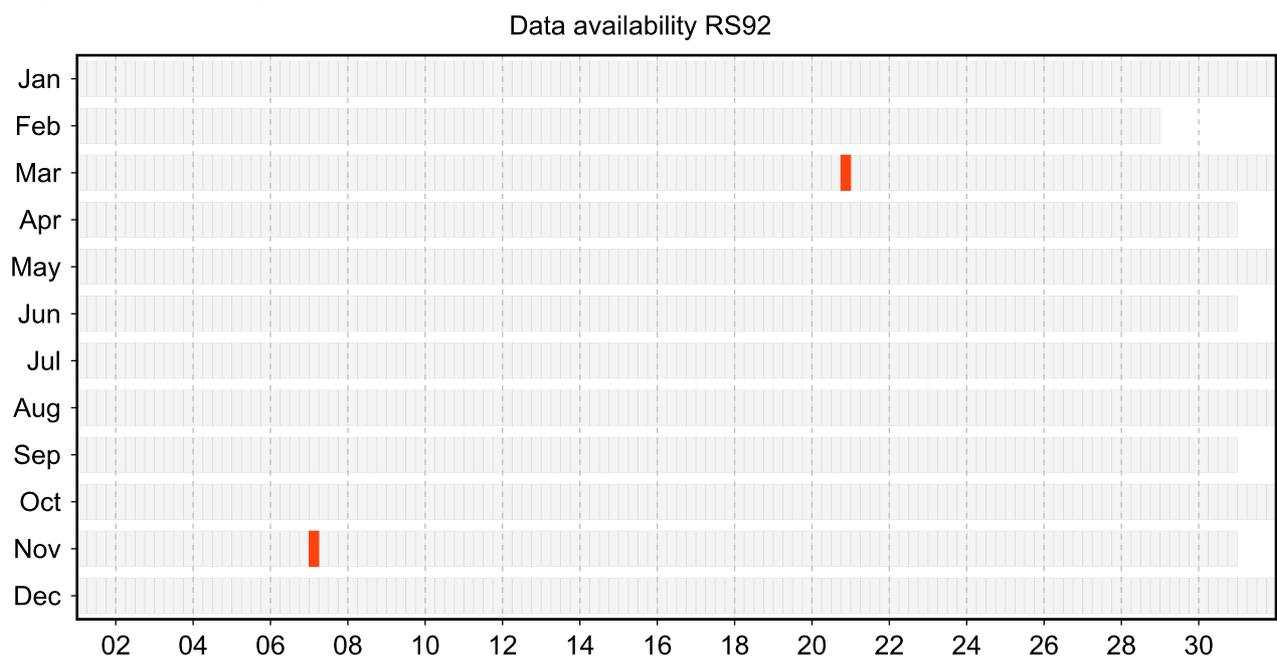
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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

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4.3.1 Stream: RS41



4.3.2 Stream: RS92



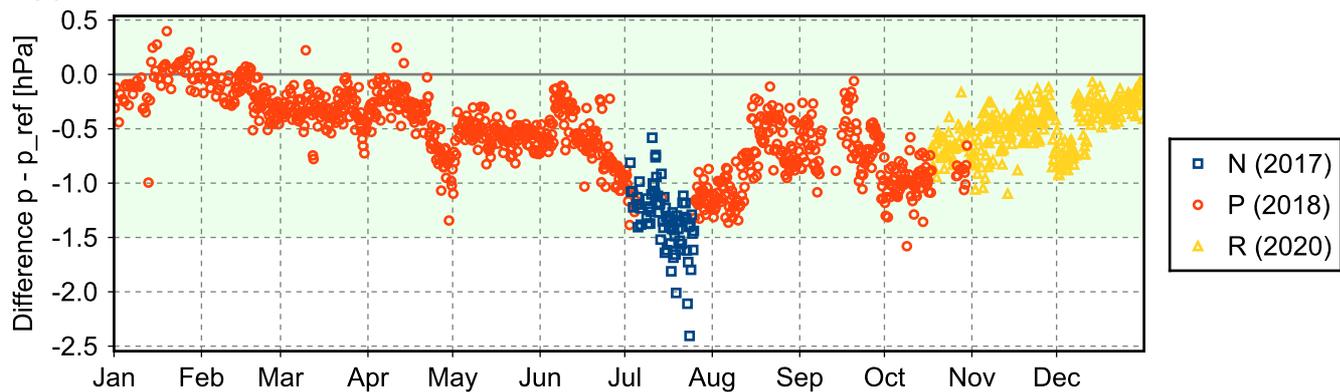
4.4 Instrument combinations of BAR-RS-02

Count	Instrument combination
1346	RS41
2	RS92

4.5 Instrument ground check

4.5.1 Stream: RS41

(1) GroundCheck: GC-RI41



4.6 Measurement events

