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GLOBAL CLIMATE OBSERVING
SYSTEM (GCOS)

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**15th GRUAN Implementation-
Coordination Meeting (ICM-15)**

Session 5

Bern

11 March - 15 March 2024

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 2022 to December 2023.

Overview

The ARM Northern Slope of Alaska (NSA) site near Utqiagvik, Alaska operated one Vaisala AS41 Autolauncher and one Vaisala MW41 manual launch system during this reporting period. The systems are designated C1 (Vaisala AS41 Autosonde) and S01 (Vaisala MW41). 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 AS41 Autosonde system, however when the need arises the manual systems will be used. All flight data is sent to the ARM Data Archive for processing and distribution.

Change and change management

The site continues its normal operational launches described above. The site is continuing its support of the JPSS/RIVAL program. In 2022-2023 the site continued support of the JPSS phase 10 by launching single radiosondes from the Vaisala Autosonde, or synchronized launches with the Autosonde and the manual system.

Vaisala sounding stations at NSA/BAR were upgraded to software version 2.21 in 2023.

In in September of 2022 the launching platform was changed from the AS15 Autosonde to the AS41 Autosonde. The site maintains the use of the RS-41SGP radiosonde and MW41 sounding software.

Resourcing

There are no resourcing issues to report at NSA. As always, the site is very remote so shipping items and expendables can sometimes take longer than desired. But we have not experienced any noteworthy issues with resourcing in 2022-2023.

Operations

The site experiences minimal operational issues since the installation of the AS41. The launch platform is still under warranty from Vaisala which contributes to speedy maintenance and corrections should issues arise.

COVID-19

No issues from COVID-19 during this reporting period.

Site assessment and certification

The site maintains GRUAN certification since 2022.

GRUAN-related research

In 2022-2023 the NSA site continued its support of the following field campaign:

- ARM Radiosondes for Joint Polar Satellite System (JPSS) Validation Field Campaign <https://www.arm.gov/research/campaigns/sgp2024jpssval>

WG-GRUAN interface

If available, guidance for the application of the SHC with the Autosonde platform would be appreciated.

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>

Future plans

The ARM program has purchased a set of standard humidity chambers. These will be implemented at all ARM GRUAN sites (GRA, BAR, SGP).



GRUAN Site Report for Barrow (BAR), 2022

Reported time range is Jan 2022 to Dec 2022

Created by the Lead Centre

Version from 2024-03-01

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	164
BAR-RS-02	Balloon-Borne Sounding System (SONDE) at Barrow	Sounding Site	3	1212

1.2 General comments from Lead Centre

1.2.1 General

ARM employs an automated procedure to transmit raw measurement data.

1.2.2 Request

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.

It is strongly recommended to use a manufacturer independent ground check (e.g. SHC) for the Vaisala radiosonde.

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 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.

3.1.2 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		164	164	
RS41-RAW	001		164	
RS41-EDT	001		164	
RS41-GDP	001		163	

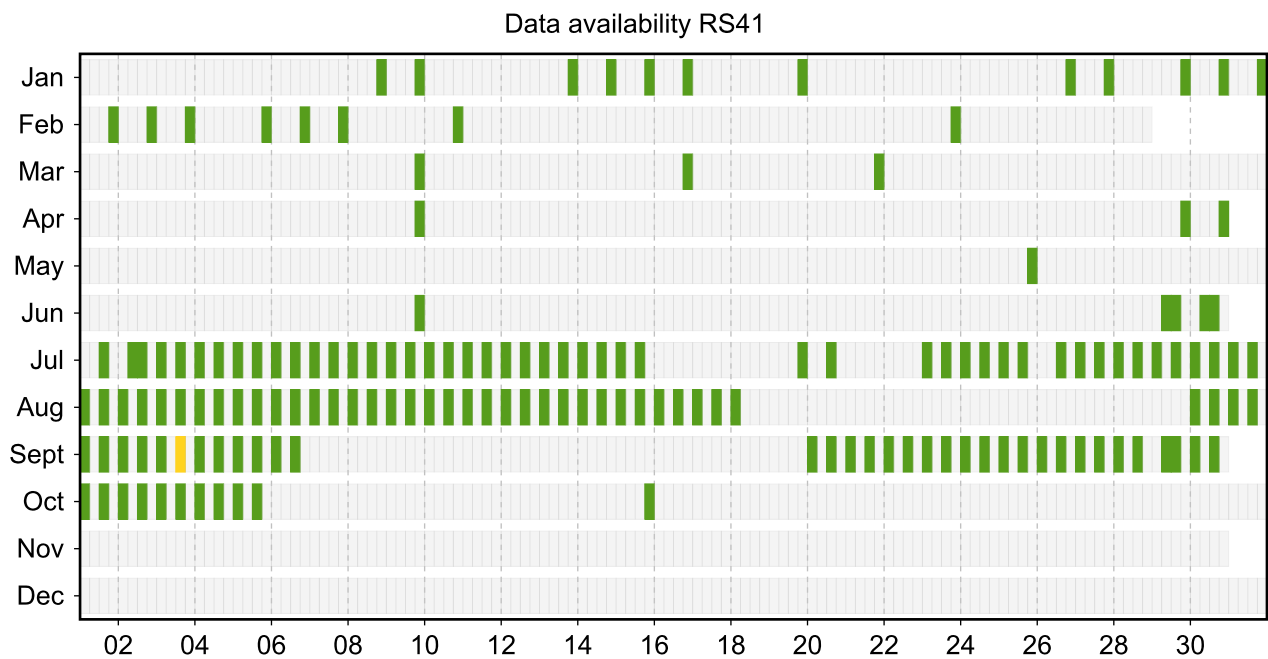
3.3 Availability of data products

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



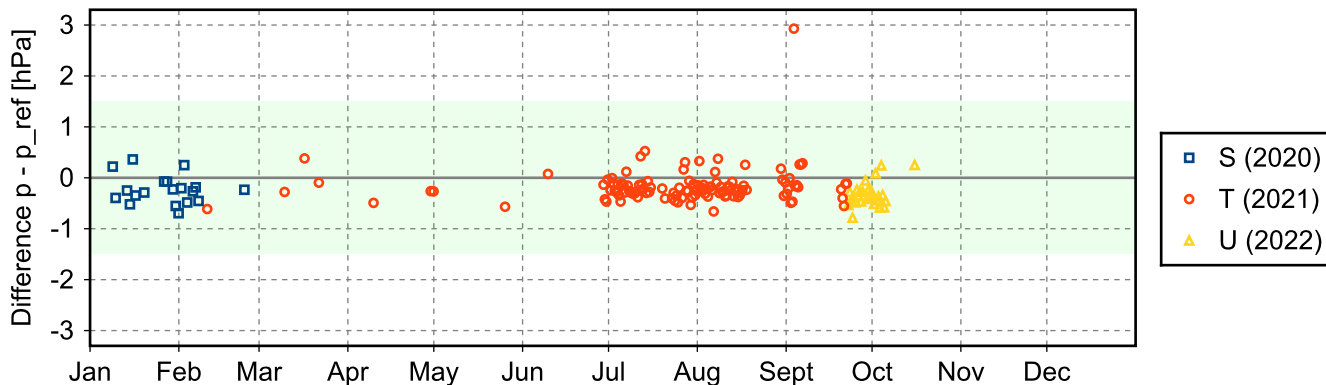
3.4 Instrument combinations of BAR-RS-01

Count	Instrument combination
164	RS41

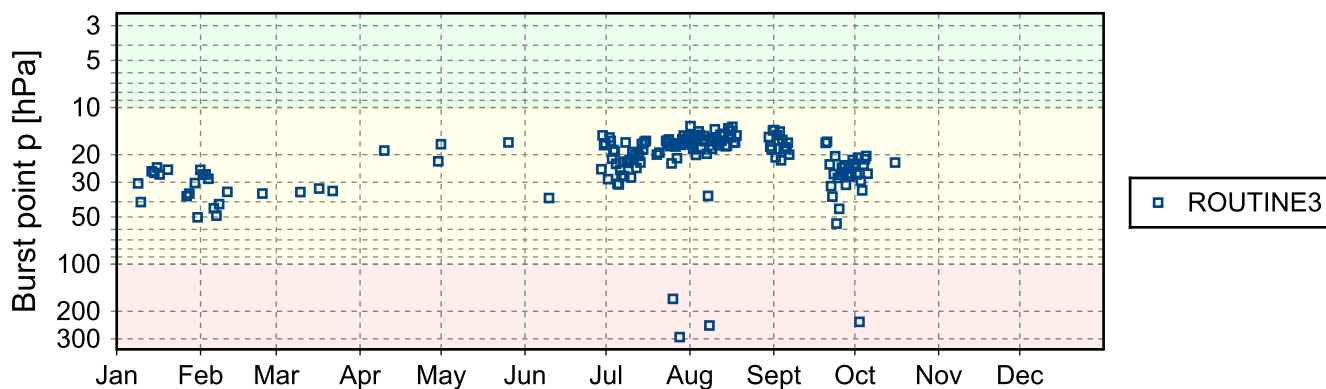
3.5 Instrument ground check

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.

4.1.2 Data quality

The reference pressure sensor seems to drift (e.g. seasonal dependence?).

4.1.3 General

This is the autolauncher system.

The ARM facility code is C1.

Recommended burst altitude of 10 hPa is not reached on a regular basis (on average 20 hPa).

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		1212	1212	
RS41-RAW	001		1212	
RS41-EDT	001		1191	
RS41-GDP	001		1187	

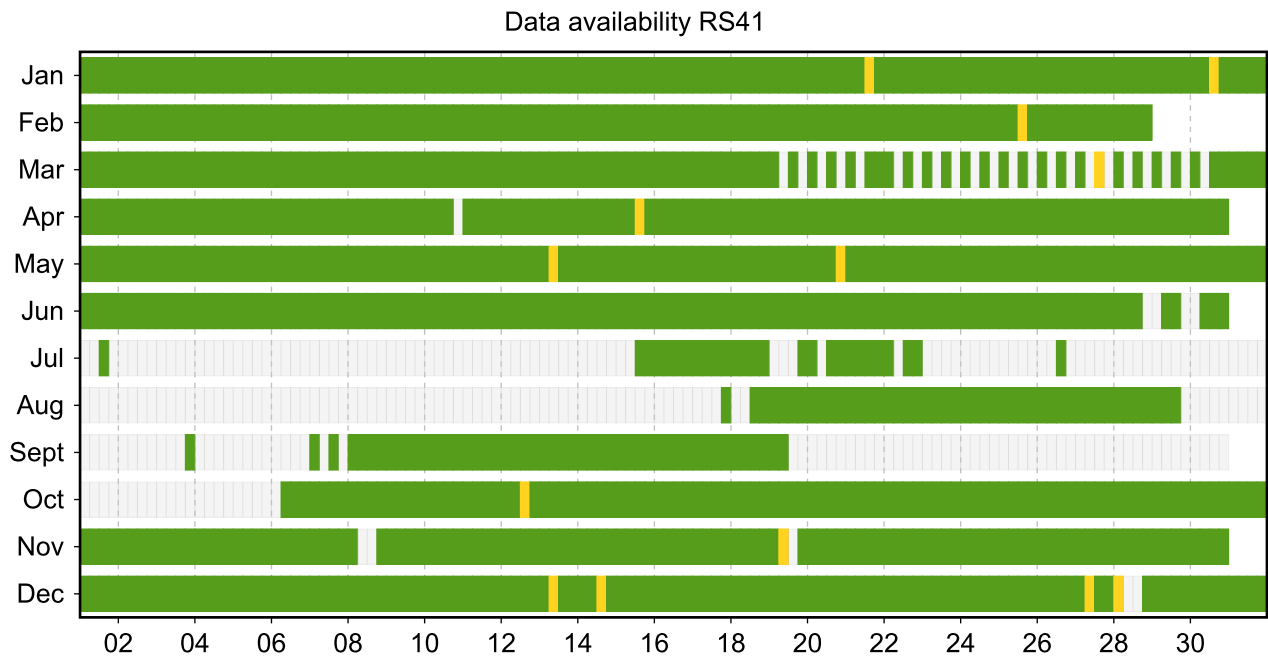
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4.3.1 Stream: RS41



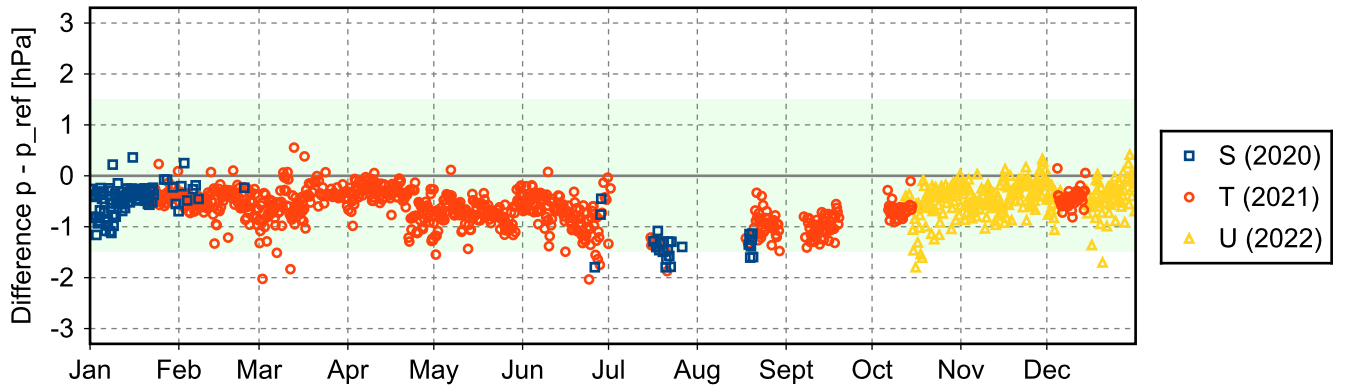
4.4 Instrument combinations of BAR-RS-02

Count	Instrument combination
1212	RS41

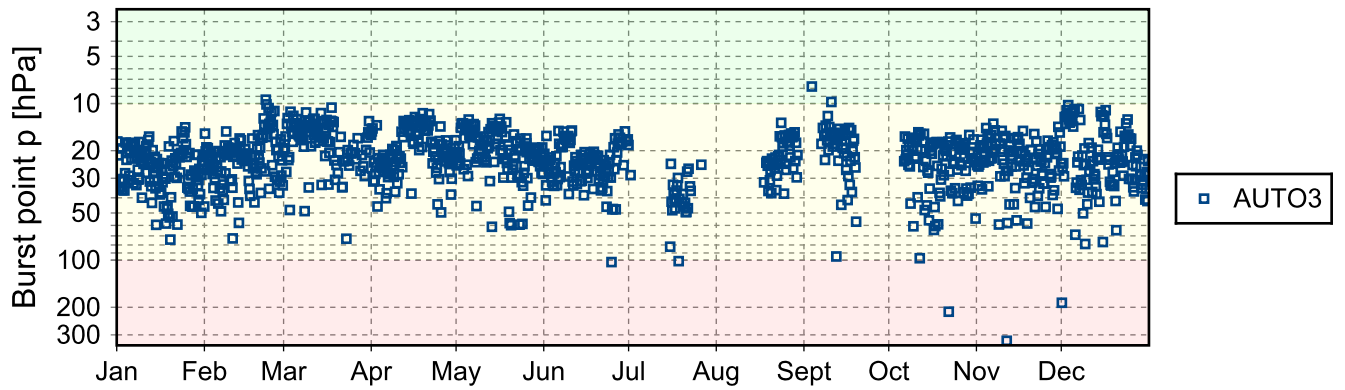
4.5 Instrument ground check

4.5.1 Stream: RS41

(1) GroundCheck: GC-R141



4.6 Measurement events





GRUAN Site Report for Barrow (BAR), 2023

Reported time range is Jan 2023 to Dec 2023
Created by the Lead Centre
Version from 2024-03-01

1 General GRUAN site information

Object	Value
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Unique GRUAN ID	BAR
Geographical position	71.3233 °N, -156.6158 °W, 8.0 m
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Operators	currently 0, changes +0 / -0
Sounding Site	2
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BAR-RS-01	Balloon-Borne Sounding System (SONDE) at Barrow	Sounding Site	4	74
BAR-RS-02	Balloon-Borne Sounding System (SONDE) at Barrow	Sounding Site	3	1386

1.2 General comments from Lead Centre

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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

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The ARM facility code is S01.

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3.2.1 Stream: RS41

RS41		74	74	
RS41-RAW	001		74	
RS41-EDT	001		74	
RS41-GDP	001		74	

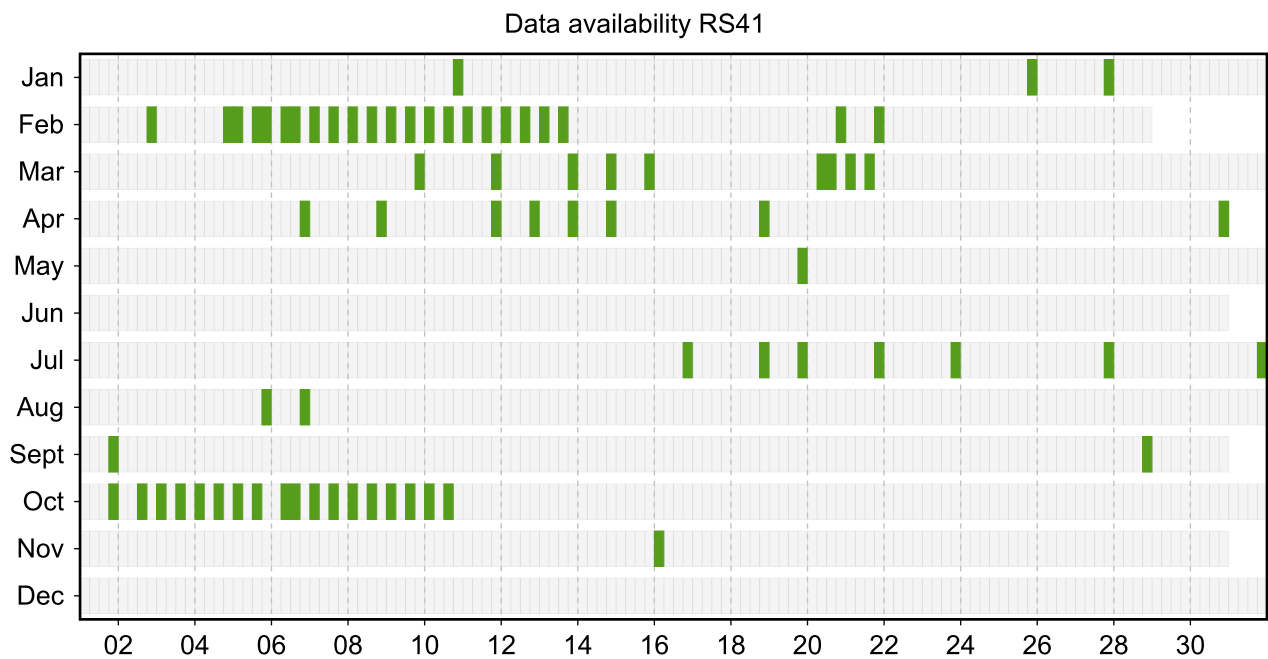
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3.3.1 Stream: RS41



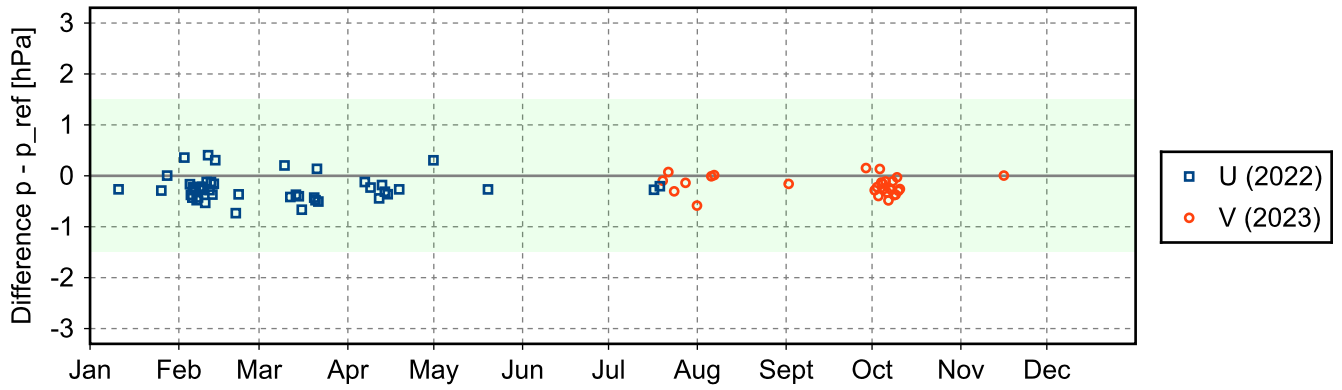
3.4 Instrument combinations of BAR-RS-01

Count	Instrument combination
74	RS41

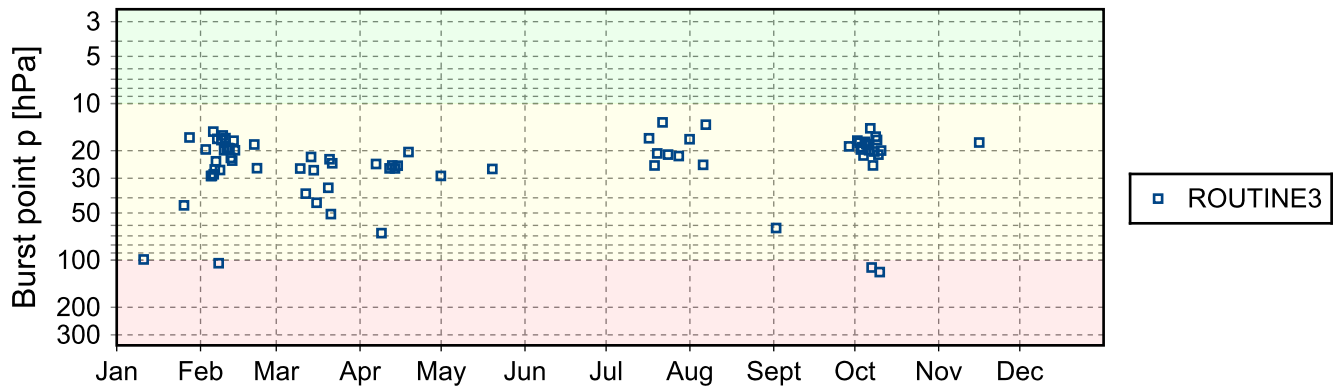
3.5 Instrument ground check

3.5.1 Stream: RS41

(1) GroundCheck: GC-R141



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

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4.1.3 General

This is the autolauncher system.

The ARM facility code is C1.

Increase of burst altitude, but recommended burst altitude of 10 hPa is not reached on a regular basis (on average 15 hPa).

4.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI
---------	---------	--------------------	-----------------	---------------------

4.2.1 Stream: RS41

RS41		1386	1386	
RS41-RAW	001		1385	
RS41-EDT	001		1345	
RS41-GDP	001		1322	

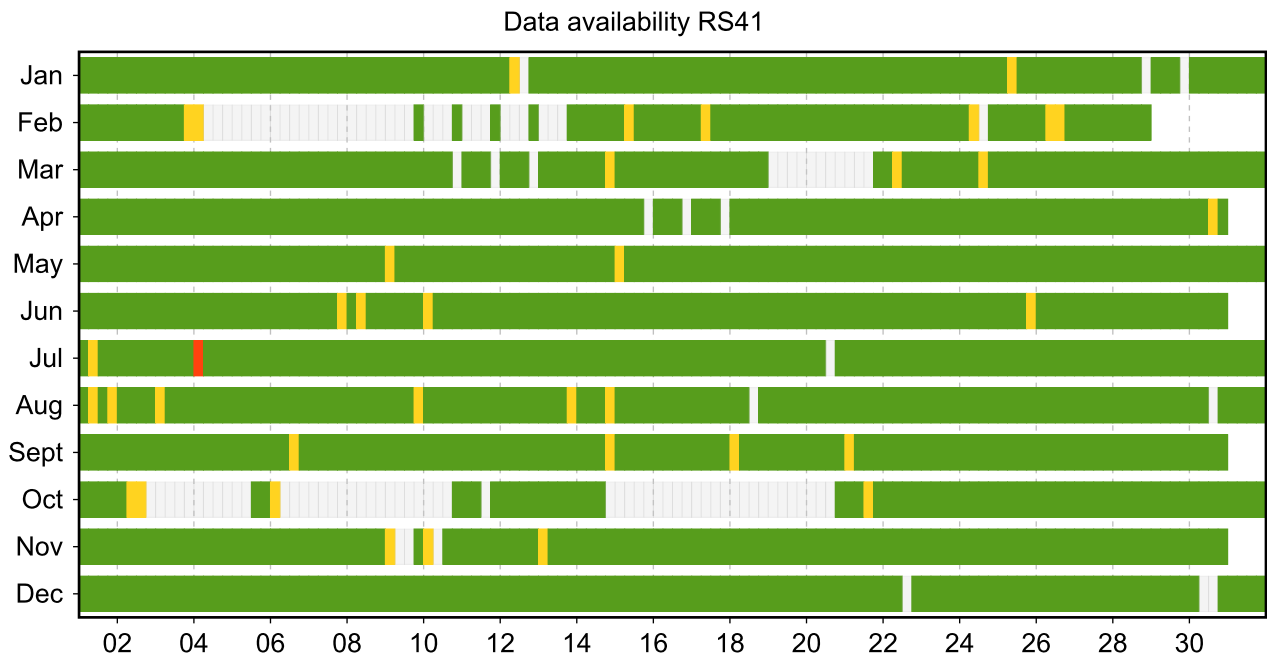
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4.3.1 Stream: RS41



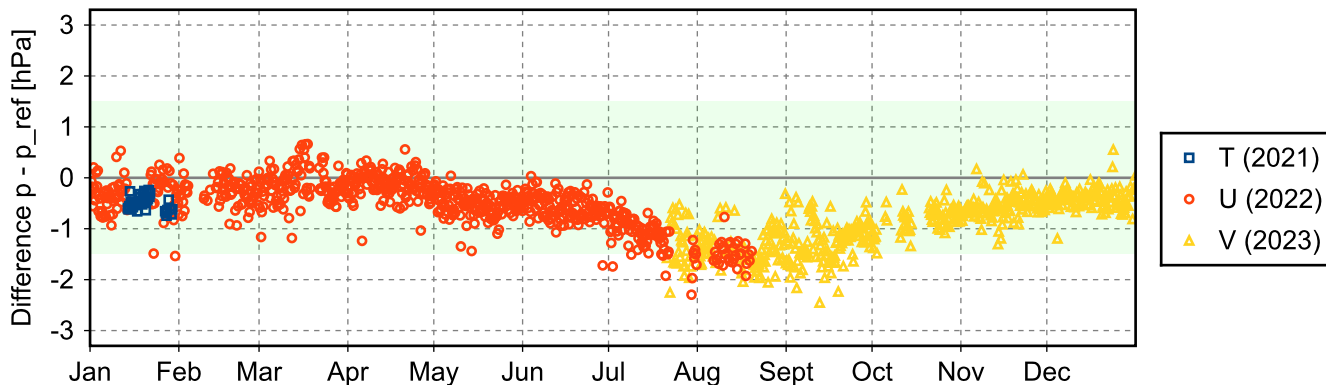
4.4 Instrument combinations of BAR-RS-02

Count	Instrument combination
1386	RS41

4.5 Instrument ground check

4.5.1 Stream: RS41

(1) GroundCheck: GC-RI41



4.6 Measurement events

