file name : IMOS_DWM-SOTS_KF_20220523_SAZ47_FV01_SAZ47-24-2022-McLane-PARFLUX-Mark78H-21-2000m_END-20230428_C-20241022.nc

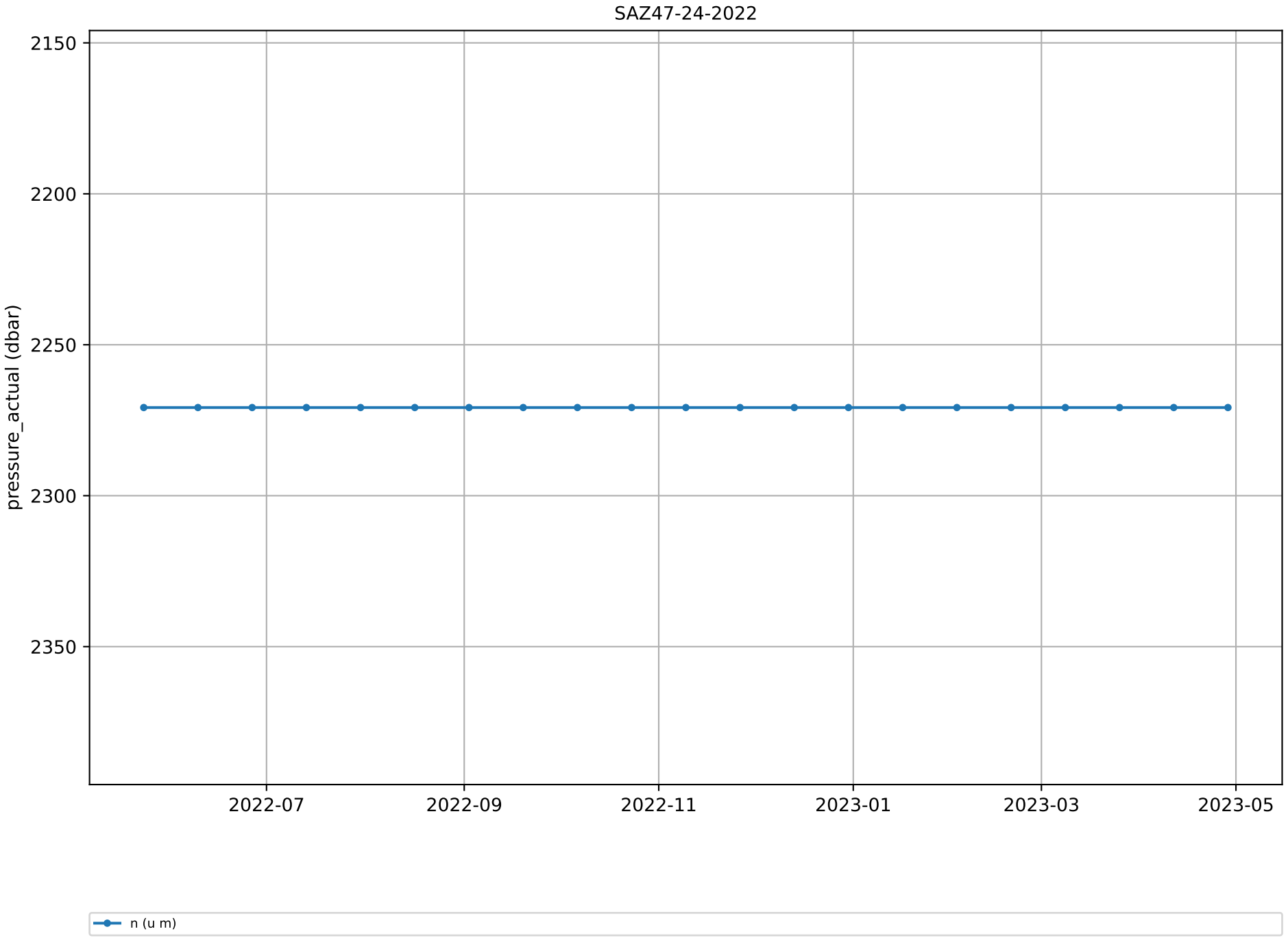
Dimensions:
    TIME (21)
    bnds (2)

Variables:
    TIME ('TIME',) : long_name = time of sample midpoint (days since 1950-01-01T00:00:00 UTC) : type float64
    TIME_bnds ('TIME', 'bnds') : long_name = time sample open, closed (days since 1950-01-01T00:00:00 UTC) : type float64
    NOMINAL_DEPTH () : long_name = nominal depth (m) : type float64
    LATITUDE () : long_name = latitude of anchor (degrees_north) : type float64
    LONGITUDE () : long_name = longitude of anchor (degrees_east) : type float64
    pressure_actual ('TIME',) : long_name = actual pressure (dbar) : type float32
    sample ('TIME',) : long_name = sample number (1) : type float32
    sample_quality_control ('TIME',) : long_name = quality flag for sample number : type int8
    mass_flux ('TIME',) : long_name = particulate total mass flux (mg m-2 d-1) : type float32
    mass_flux_uncertainty ('TIME',) : long_name = uncertainty for particulate total mass flux (mg m-2 d-1) : type float32
    mass_flux_quality_control ('TIME',) : long_name = quality flag for particulate total mass flux : type int8
    SAL_BRINE ('TIME',) : long_name = sample supernatant practical salinity (1) : type float32
    SAL_BRINE_uncertainty ('TIME',) : long_name = uncertainty for sample supernatant practical salinity (1) : type float32
    SAL_BRINE_quality_control ('TIME',) : long_name = quality flag for sample supernatant practical salinity : type int8
    pH_BRINE ('TIME',) : long_name = sample supernatant pH NBS scale (1) : type float32
    pH_BRINE_uncertainty ('TIME',) : long_name = uncertainty for sample supernatant pH NBS scale (1) : type float32
    pH_BRINE_quality_control ('TIME',) : long_name = quality flag for sample supernatant pH NBS scale : type int8
    PC_mass_flux ('TIME',) : long_name = particulate total carbon mass flux (mg m-2 d-1) : type float32
    PC_mass_flux_uncertainty ('TIME',) : long_name = uncertainty for particulate total carbon mass flux (mg m-2 d-1) : type float32
    PC_mass_flux_quality_control ('TIME',) : long_name = quality flag for particulate total carbon mass flux : type int8
    PN_mass_flux ('TIME',) : long_name = particulate total nitrogen mass flux (mg m-2 d-1) : type float32
    PN_mass_flux_uncertainty ('TIME',) : long_name = uncertainty for particulate total nitrogen mass flux (mg m-2 d-1) : type float32
    PN_mass_flux_quality_control ('TIME',) : long_name = quality flag for particulate total nitrogen mass flux : type int8
    POC_mass_flux ('TIME',) : long_name = particulate organic carbon mass flux (mg m-2 d-1) : type float32
    POC_mass_flux_uncertainty ('TIME',) : long_name = uncertainty for particulate organic carbon mass flux (mg m-2 d-1) : type float32
    POC_mass_flux_quality_control ('TIME',) : long_name = quality flag for particulate organic carbon mass flux : type int8
    PIC_mass_flux ('TIME',) : long_name = particulate inorganic carbon mass flux (mg m-2 d-1) : type float32
    PIC_mass_flux_uncertainty ('TIME',) : long_name = uncertainty for particulate inorganic carbon mass flux (mg m-2 d-1) : type float32
    PIC_mass_flux_quality_control ('TIME',) : long_name = quality flag for particulate inorganic carbon mass flux : type int8
    BSi_mass_flux ('TIME',) : long_name = particulate biogenic silicon mass flux (mg m-2 d-1) : type float32
    BSi_mass_flux_uncertainty ('TIME',) : long_name = uncertainty for particulate biogenic silicon mass flux (mg m-2 d-1) : type float32
    BSi_mass_flux_quality_control ('TIME',) : long_name = quality flag for particulate biogenic silicon mass flux : type int8

abstract : Oceanographic and meteorological data from the Southern Ocean Time Series observatory in the Southern Ocean southwest of Tasmania.
acknowledgement : Any users of IMOS data are required to clearly acknowledge the source of the material derived from IMOS in the format: "Data was sourced
      from the Integrated Marine Observing System (IMOS) - IMOS is a national collaborative research infrastructure, supported by the
      Australian Government."
author : Cathryn Wynn-Edwards
author_email : cathryn.wynn-edwards@csiro.au
cdm_data_type : Station
citation : Integrated Marine Observing System. [year-of-data-download], [Title], [Data access URL], accessed [date- of-access]
comment_archive : zooplankton > 1mm archived, photos available on request, 3/10 of sample archived
comment_data_qc_report : Wynn-Edwards, CA, Davies, DM, Shadwick, EH, Trull, TW (2020) Southern Ocean Time Series. SOTS Quality assessment and control report.
      Sediment trap particle fluxes Version 1.0. CSIRO, Australia. DOI: 10.26198/5dfad21358a8d (http://dx.doi.org/10.26198/5dfad21358a8d)
comment_generating_script : SAZxls2trapNetCDF
comment_instrument : trap area, paraflux = 0.5 m^2, IRS = 0.16 m^2
comment_sample : Due to an issue with notetaking during analysis, individual sample weights could not be verified, and thus all results have been flagged 3 –
      (Probably Bad), including in cases where a flag 2 (Probabl good) would have been applied otherwise. Please refer to the SOTS annual
      reports for additional detail if using these data. Cup 14 was missing on recovery, cup 15 was lost during processing, cups 16-19 were
      combined after splitting to provide enough material for analyses. Results are divided by the combined number of days the respective
      cups were open for.
comment_time : time is sample mid point
comment_uncertainty : Mass flux uncertainty estimates are based on weighing errors only (uniformly 0.06%), and do not include sample splitting errors (~3%) or
      trap collection efficiency variations. Chemical component flux uncertainty estimates combine the mass flux uncertainty and the
      analytical uncertainty for the component, based on variations in working standards and duplicate samples over long periods. These are
      uniformly 1.9% for PIC, 2.8% for POC, 2.1% for PC, 3.8% for PN, and 4.9% for BSi. All uncertainty estimates are 95% confidence
      intervals (1.96 standard deviations). Further details are available in Wynn-Edwards et al., 2020
contributor_name : Gemma Woodward
contributor_role : sample processing
Conventions : CF-1.6,IMOS-1.4
data_centre : Australian Ocean Data Network (AODN)
data_centre_email : info@aodn.org.au
data_mode : D
date_created : 2024-10-22T02:50:38Z
deployment_code : SAZ47-24-2022
disclaimer : Data, products and services from IMOS are provided "as is" without any warranty as to fitness for a particular purpose.
distribution_statement : Data may be re-used, provided that related metadata explaining the data has been reviewed by the user, and the data is appropriately
      acknowledged.
   Data, products and services from IMOS are provided as is without any warranty as to fitness for a particular purpose.
featureType : timeSeries
file_version : Level 1 - Quality Controlled Data
geospatial_lat_max : -46.8085
geospatial_lat_min : -46.8085
geospatial_lat_units : degrees_north
geospatial_lon_max : 141.832
geospatial_lon_min : 141.832
geospatial_lon_units : degrees_east
geospatial_vertical_max : 2000
geospatial_vertical_min : 2000
geospatial_vertical_positive : down
geospatial_vertical_units : metres
history : 2024-10-22 02:50:38 : created from : 2022_saz24_47_sed_CWE_QC.xlsx datestamp : 2024-10-22 13:47:45
institution : CSIRO; Australian Antarctic Program Partnership
institution_address : CSIRO Marine Laboratories, Castray Esp, Hobart, Tasmania 7001, Australia; 20 Castray Esplanade, Hobart Tasmania 7000, Australia
instrument : McLane-PARFLUX-Mark78H-21
instrument_serial_number : frame# 12419-02, controller# 12419-02 and Motor # 12419-02 Cup set ABx21
keywords : Oceans->Ocean Chemistry->Biogeochemical Cycles; mass_flux; SAL_BRINE; pH_BRINE; PC_mass_flux; PN_mass_flux; POC_mass_flux; PIC_mass_flux;
      BSi_mass_flux
license : http://creativecommons.org/licenses/by/4.0/
Metadata_Conventions : Unidata Dataset Discovery v1.0

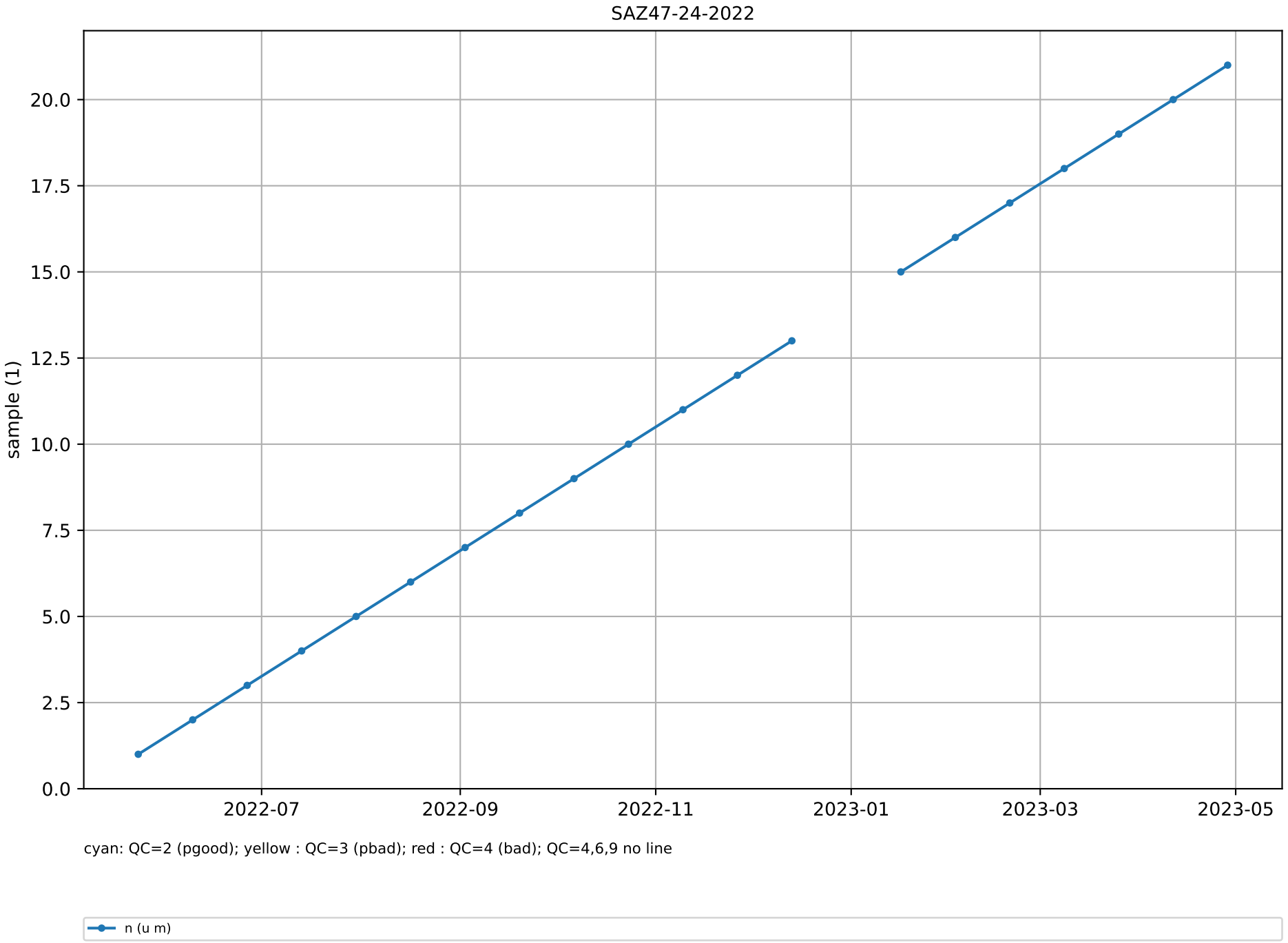
Mooring : SAZ mooring
naming_authority : IMOS
platform_code : SAZ
platform_deployment_cruise_ExpoCode : 096U20220504
platform_deployment_cruise_name : IN2022_V03
platform_deployment_ship_ICES : 096U
platform_deployment_ship_name : RV Investigator
platform_recovery_cruise_ExpoCode : 096U20230510
platform_recovery_cruise_name : IN2023_V03
platform_recovery_ship_ICES : 096U
platform_recovery_ship_name : RV Investigator
principal_investigator : Elizabeth Shadwick
principal_investigator_email : Elizabeth.Shadwick@csiro.au
project : Integrated Marine Observing System (IMOS)
references : Particle flux QC report: http://www.imos.org.au http://dx.doi.org/10.26198/5dfad21358a8d; SOTS annual reports: https://catalogue-
      imos.aodn.org.au/geonetwork/srv/eng/catalog.search#/metadata/afc166ce-6b34-44d9-b64c-8bb10fd43a07
site_code : SOTS
source : Moorings
standard_name_vocabulary : NetCDF Climate and Forecast (CF) Metadata Convention Standard Name Table 67
time_coverage_end : 2023-04-28T12:00:00Z
time_coverage_start : 2022-05-23T12:00:00Z
time_deployment_end : 2023-05-20T00:00:00Z
time_deployment_start : 2022-05-09T00:00:00Z
title : Oceanographic and meteorological data from the Southern Ocean Time Series observatory in the Southern Ocean southwest of Tasmania.
voyage_deployment : https://www.cmar.csiro.au/data/trawler/survey_details.cfm?survey=IN2022_V03
voyage_deployment_start_date : 04-May-2022
voyage_recovery : https://www.cmar.csiro.au/data/trawler/survey_details.cfm?survey=IN2023_V03
voyage_recovery_start_date : 10-May-2023

Variable : pressure_actual('TIME',)
_FillValue : nan
long_name : actual pressure
units : dbar
uncertainty : 3
comment : actual
comment_method : pressure from nearest instrument on mooring, extrapolated to trap position
valid_min : -2.0
valid_max : 12000.0
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH

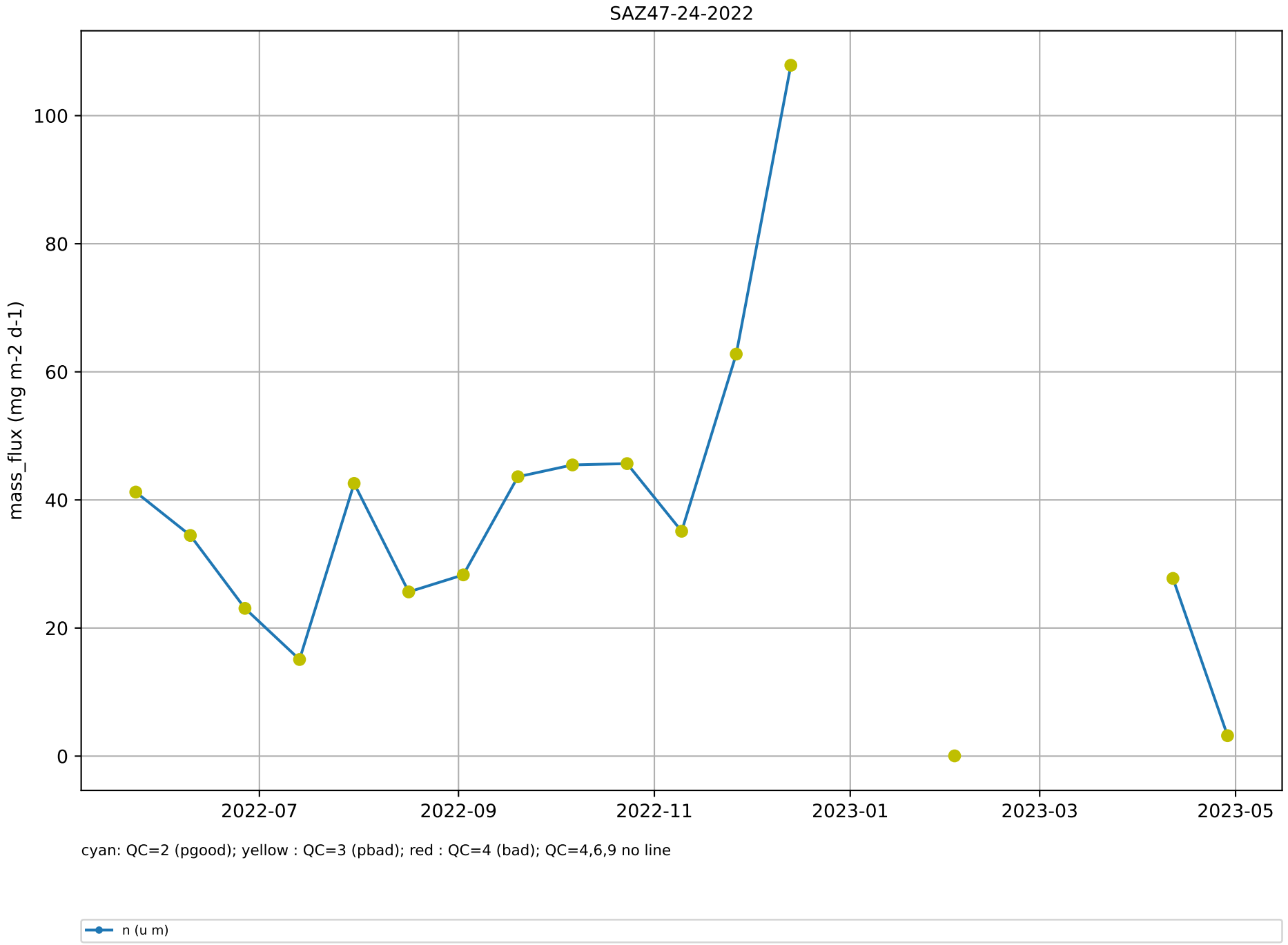

SAZ47-24-2022
pressure_actual (dbar)
2150
2200
2250
2300
2350
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
n (u m)

Variable : sample('TIME',)
_FillValue : nan
long_name : sample number
units : 1
comment_sample : Due to an issue with notetaking during analysis, individual sample weights could not be verified, and thus all results have been flagged 3 – (Probably
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH
ancillary_variables : sample_quality_control

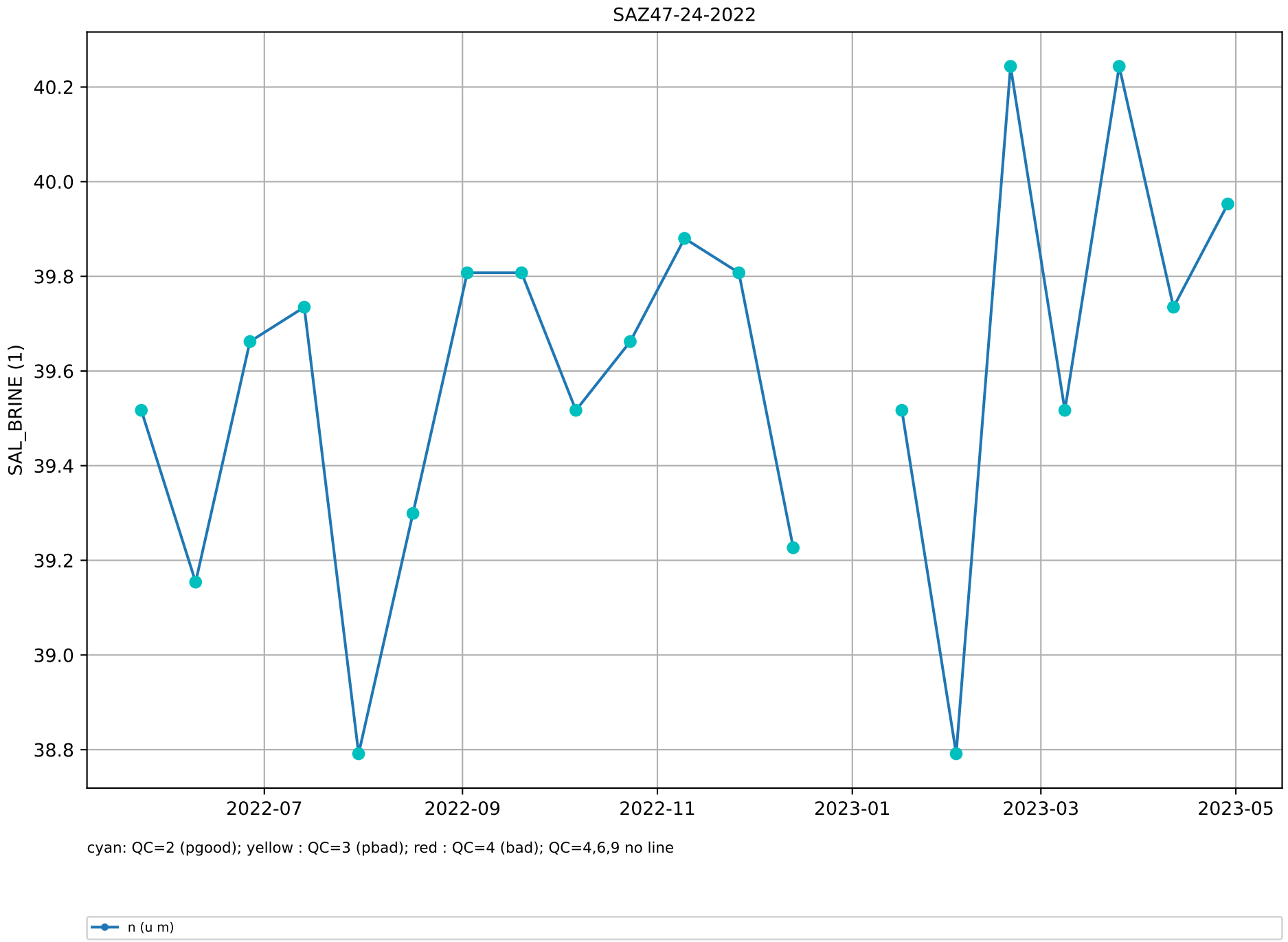
AUX : sample_quality_control('TIME',)
_FillValue : 127
long_name : quality flag for sample number
quality_control_conventions : IMOS standard flags
valid_min : 0
valid_max : 9
flag_values : [0 1 2 3 4 9]
flag_meanings : unknown good_data probably_good_data probably_bad_data bad_data missing_value


SAZ47-24-2022
sample (1)
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
cyan: QC=2 (pgood); yellow : QC=3 (pbad); red : QC=4 (bad); QC=4,6,9 no line
n (u m)

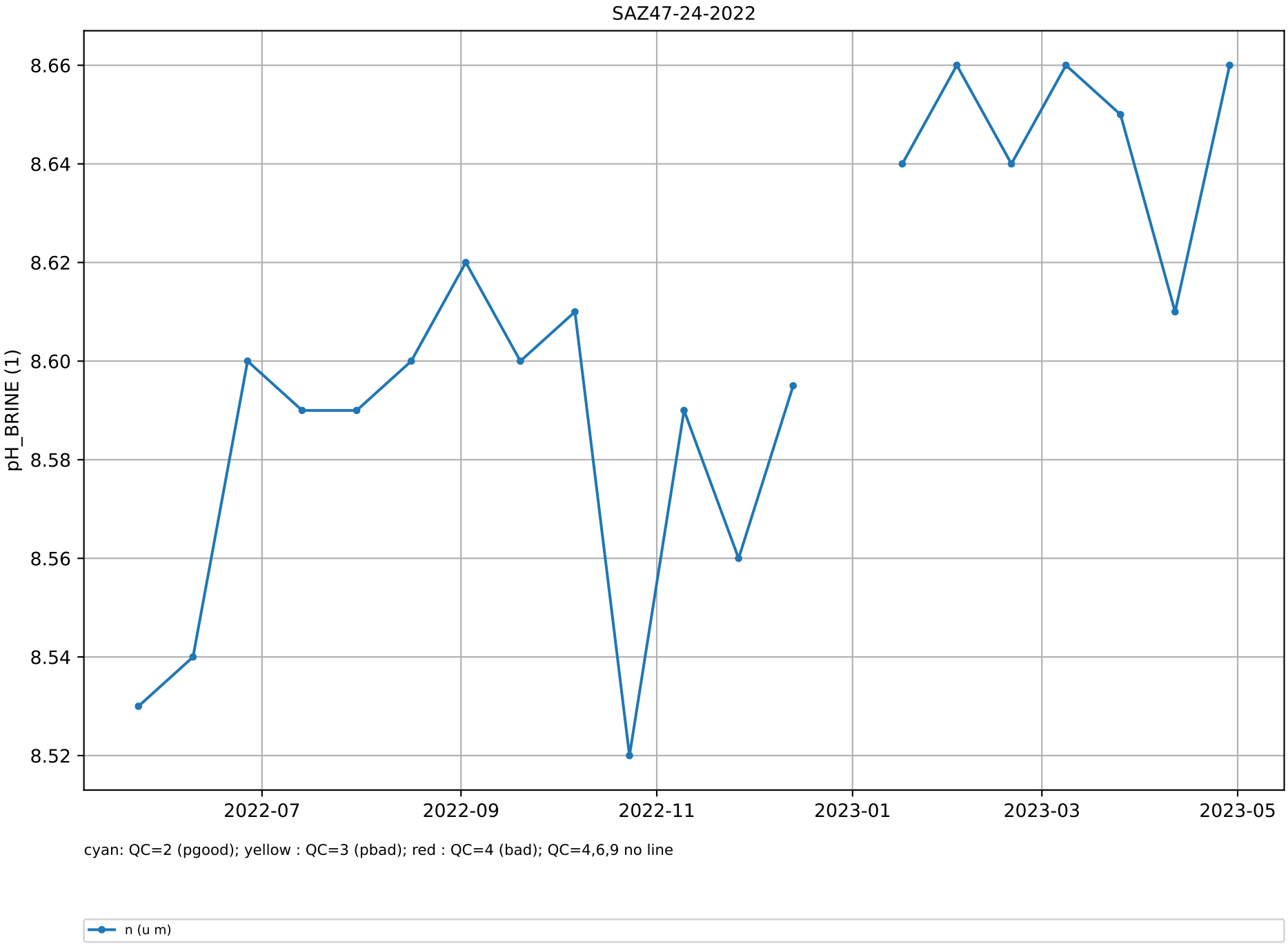
```
Variable : mass_flux('TIME',)
_FillValue : nan
long_name : particulate total mass flux
units : mg m-2 d-1
relative_uncertainty : 0.0006
comment : <1mm
comment_method : dry wt 60C
valid_min : -10.0
valid_max : 1000.0
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH
ancillary_variables : mass_flux_uncertainty mass_flux_quality_control

AUX : mass_flux_uncertainty('TIME',)
_FillValue : nan
units : mg m-2 d-1
long_name : uncertainty for particulate total mass flux

AUX : mass_flux_quality_control('TIME',)
_FillValue : 127
long_name : quality flag for particulate total mass flux
quality_control_conventions : IMOS standard flags
valid_min : 0
valid_max : 9
flag_values : [0 1 2 3 4 9]
flag_meanings : unknown good_data probably_good_data probably_bad_data bad_data missing_value
```


SAZ47-24-2022
mass_flux (mg m-2 d-1)
100
80
60
40
20
0
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
cyan: QC=2 (pgood); yellow : QC=3 (pbad); red : QC=4 (bad); QC=4,6,9 no line
n (u m)

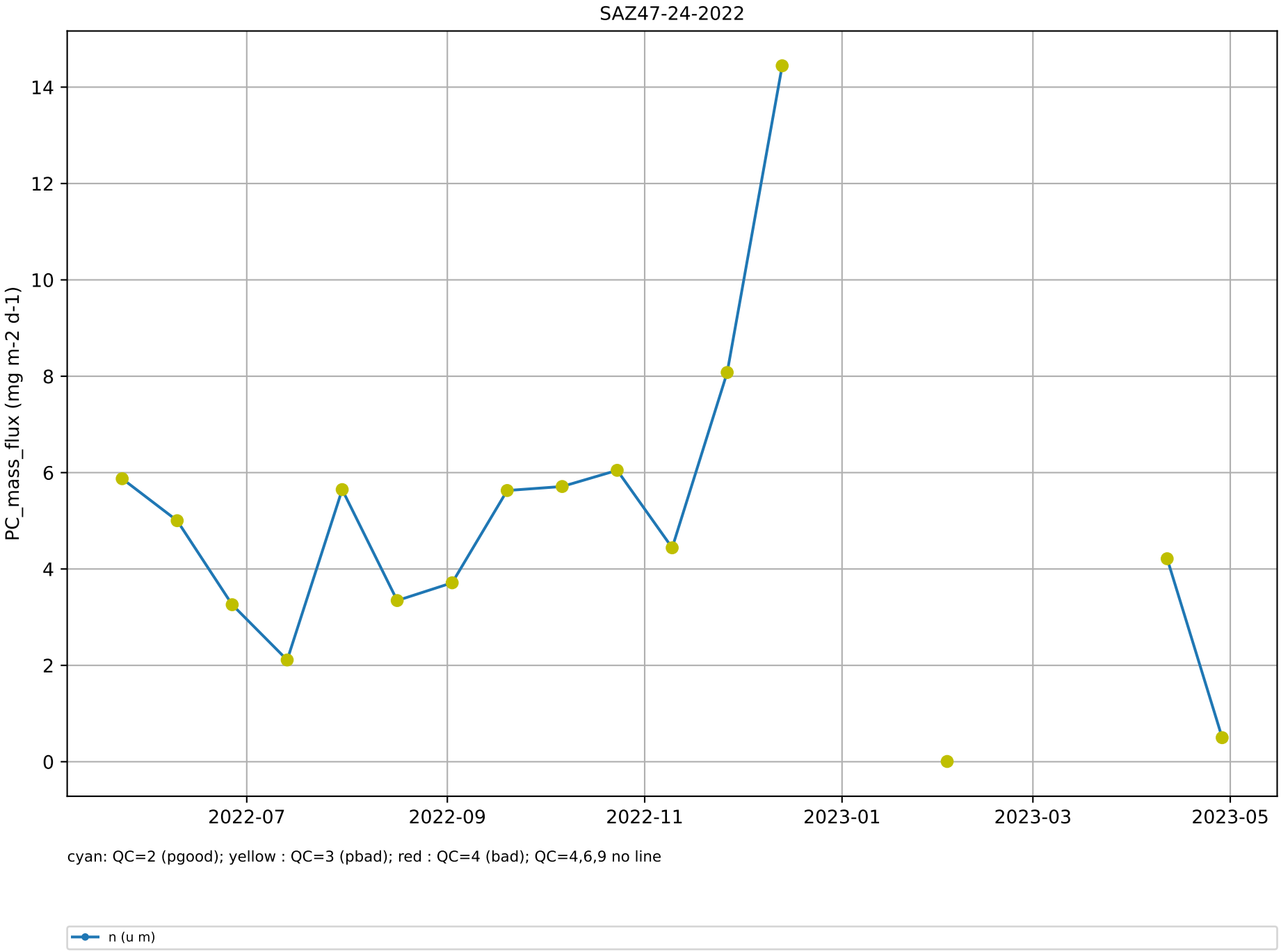
```
Variable : SAL_BRINE('TIME',)
_FillValue : nan
long_name : sample supernatant practical salinity
units : 1
relative_uncertainty : 0.022
comment : supernatant
comment_method : Supernatant salinity measured as conductivity on recovery as indicator of brine washout
valid_min : 20.0
valid_max : 60.0
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH
ancillary_variables : SAL_BRINE_uncertainty SAL_BRINE_quality_control

AUX : SAL_BRINE_uncertainty('TIME',)
_FillValue : nan
units : 1
long_name : uncertainty for sample supernatant practical salinity

AUX : SAL_BRINE_quality_control('TIME',)
_FillValue : 127
long_name : quality flag for sample supernatant practical salinity
quality_control_conventions : IMOS standard flags
valid_min : 0
valid_max : 9
flag_values : [0 1 2 3 4 9]
flag_meanings : unknown good_data probably_good_data probably_bad_data bad_data missing_value
```


SAZ47-24-2022
SAL_BRINE (1)
40.2
40.0
39.8
39.6
39.4
39.2
39.0
38.8
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
cyan: QC=2 (pgood); yellow : QC=3 (pbad); red : QC=4 (bad); QC=4,6,9 no line
n (u m)

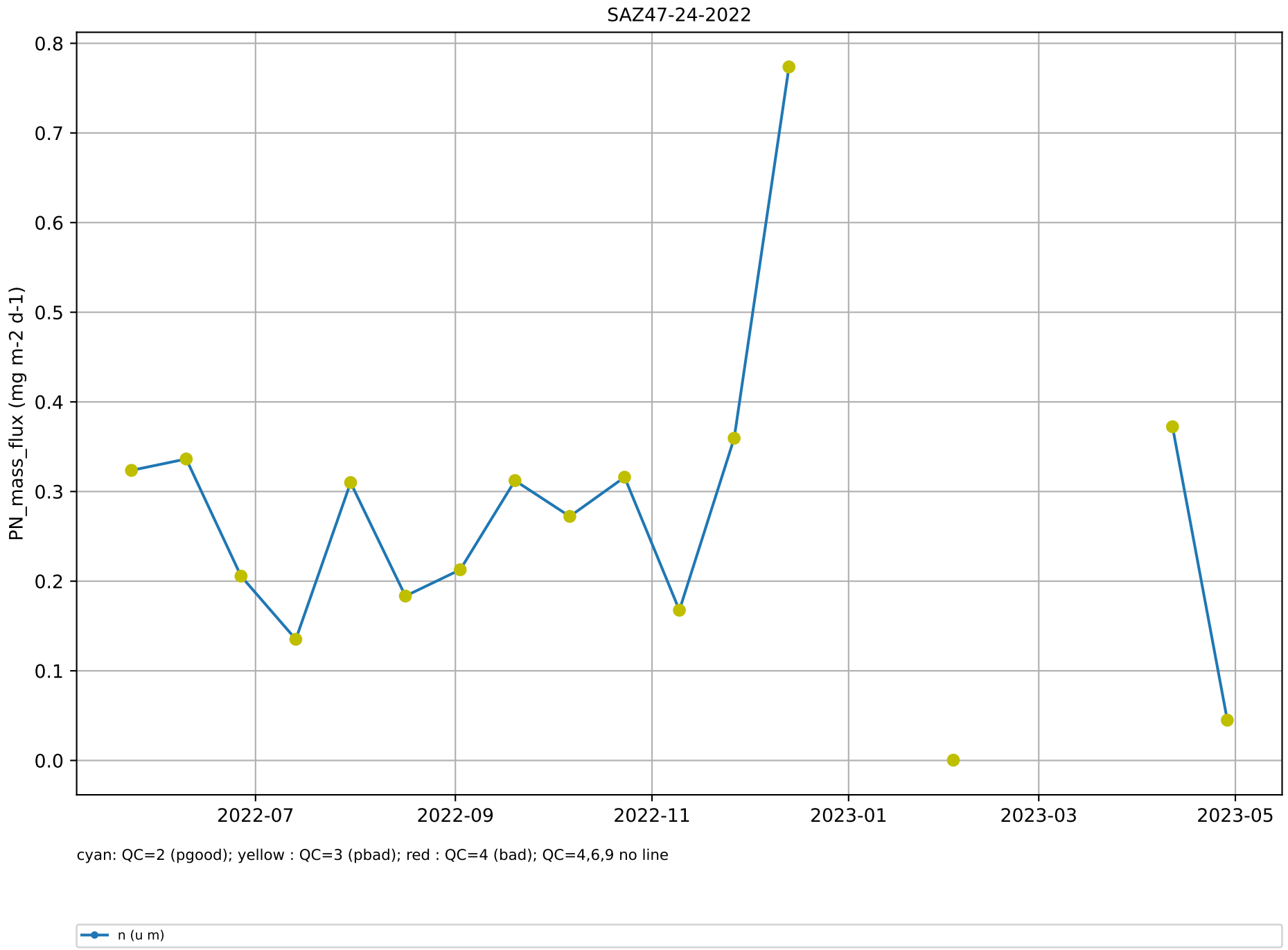
```
Variable : pH_BRINE('TIME',)
_FillValue : nan
long_name : sample supernatant pH NBS scale
units : 1
relative_uncertainty : 0.029
comment : supernatant
comment_method : Supernatant pH measured potentiometrically on recovery as indicator of brine washout
valid_min : 2.0
valid_max : 12.0
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH
ancillary_variables : pH_BRINE_uncertainty pH_BRINE_quality_control

AUX : pH_BRINE_uncertainty('TIME',)
_FillValue : nan
units : 1
long_name : uncertainty for sample supernatant pH NBS scale

AUX : pH_BRINE_quality_control('TIME',)
_FillValue : 127
long_name : quality flag for sample supernatant pH NBS scale
quality_control_conventions : IMOS standard flags
valid_min : 0
valid_max : 9
flag_values : [0 1 2 3 4 9]
flag_meanings : unknown good_data probably_good_data probably_bad_data bad_data missing_value
```


SAZ47-24-2022
pH_BRINE (1)
8.66
8.64
8.62
8.60
8.58
8.56
8.54
8.52
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
cyan: QC=2 (pgood); yellow : QC=3 (pbad); red : QC=4 (bad); QC=4,6,9 no line
n (u m)

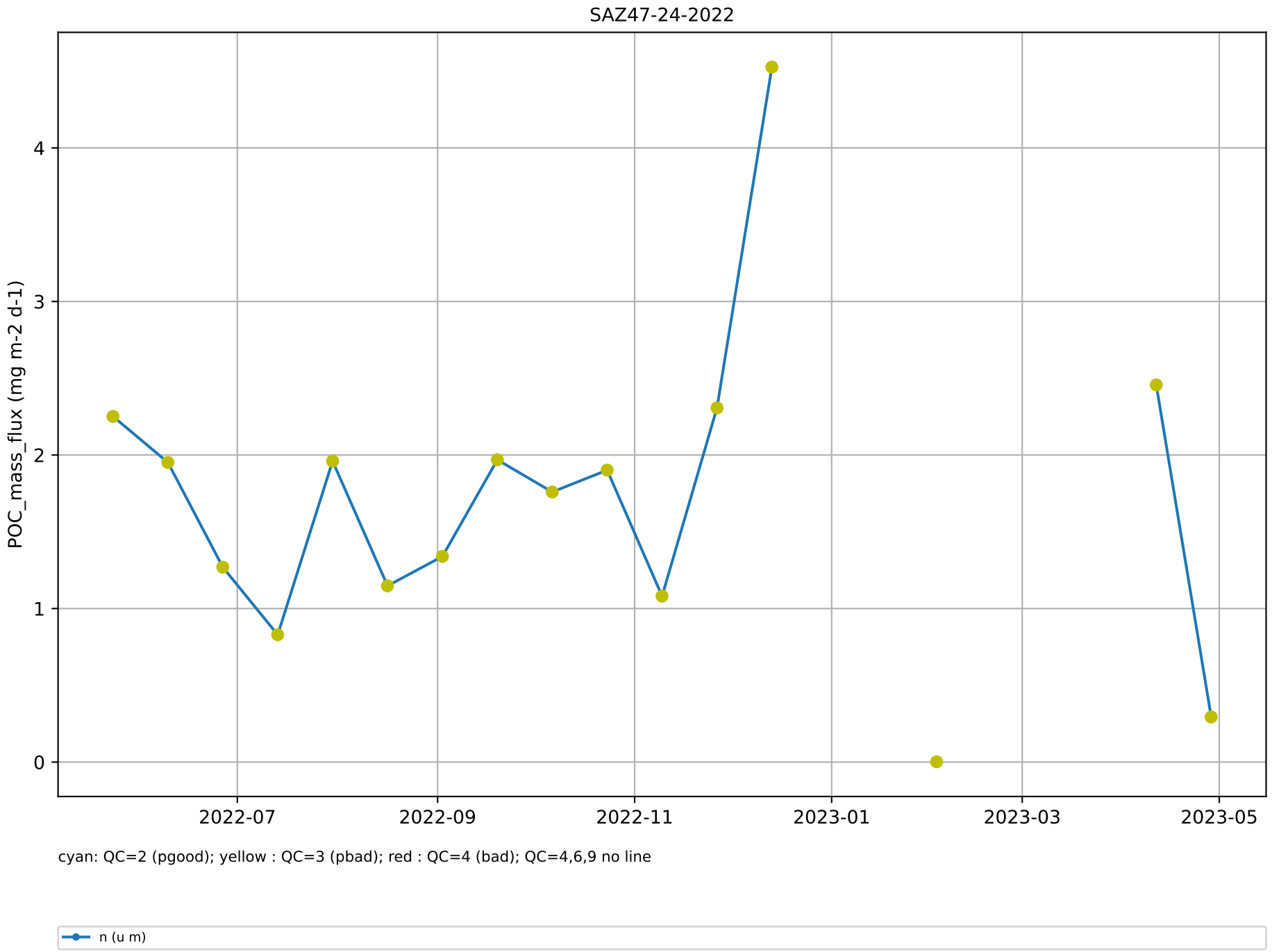
```
Variable : PC_mass_flux('TIME',)
_FillValue : nan
long_name : particulate total carbon mass flux
units : mg m-2 d-1
relative_uncertainty : 0.021
comment : <1mm
comment_method : elemental analyser total carbon
valid_min : -1.0
valid_max : 100.0
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH
ancillary_variables : PC_mass_flux_uncertainty PC_mass_flux_quality_control

AUX : PC_mass_flux_uncertainty('TIME',)
_FillValue : nan
units : mg m-2 d-1
long_name : uncertainty for particulate total carbon mass flux

AUX : PC_mass_flux_quality_control('TIME',)
_FillValue : 127
long_name : quality flag for particulate total carbon mass flux
quality_control_conventions : IMOS standard flags
valid_min : 0
valid_max : 9
flag_values : [0 1 2 3 4 9]
flag_meanings : unknown good_data probably_good_data probably_bad_data bad_data missing_value
```


SAZ47-24-2022
PC_mass_flux (mg m-2 d-1)
0
2
4
6
8
10
12
14
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
cyan: QC=2 (pgood); yellow : QC=3 (pbad); red : QC=4 (bad); QC=4,6,9 no line
n (u m)

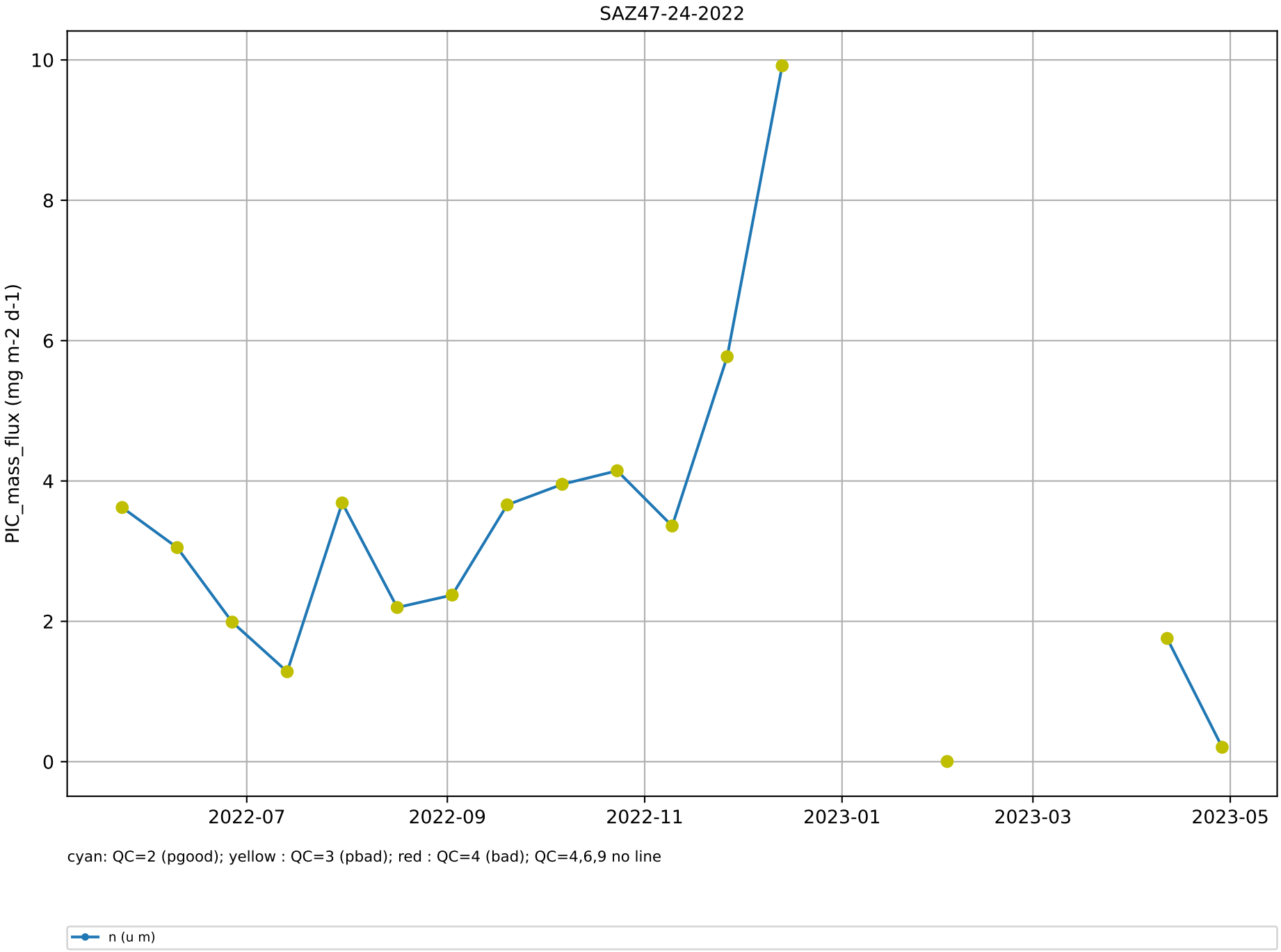
```
Variable : PN_mass_flux('TIME',)
_FillValue : nan
long_name : particulate total nitrogen mass flux
units : mg m-2 d-1
relative_uncertainty : 0.038
comment : <1mm
comment_method : elemental analyser total nitrogen
valid_min : -1.0
valid_max : 100.0
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH
ancillary_variables : PN_mass_flux_uncertainty PN_mass_flux_quality_control

AUX : PN_mass_flux_uncertainty('TIME',)
_FillValue : nan
units : mg m-2 d-1
long_name : uncertainty for particulate total nitrogen mass flux

AUX : PN_mass_flux_quality_control('TIME',)
_FillValue : 127
long_name : quality flag for particulate total nitrogen mass flux
quality_control_conventions : IMOS standard flags
valid_min : 0
valid_max : 9
flag_values : [0 1 2 3 4 9]
flag_meanings : unknown good_data probably_good_data probably_bad_data bad_data missing_value
```


SAZ47-24-2022
PN_mass_flux (mg m-2 d-1)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
cyan: QC=2 (pgood); yellow : QC=3 (pbad); red : QC=4 (bad); QC=4,6,9 no line
n (u m)

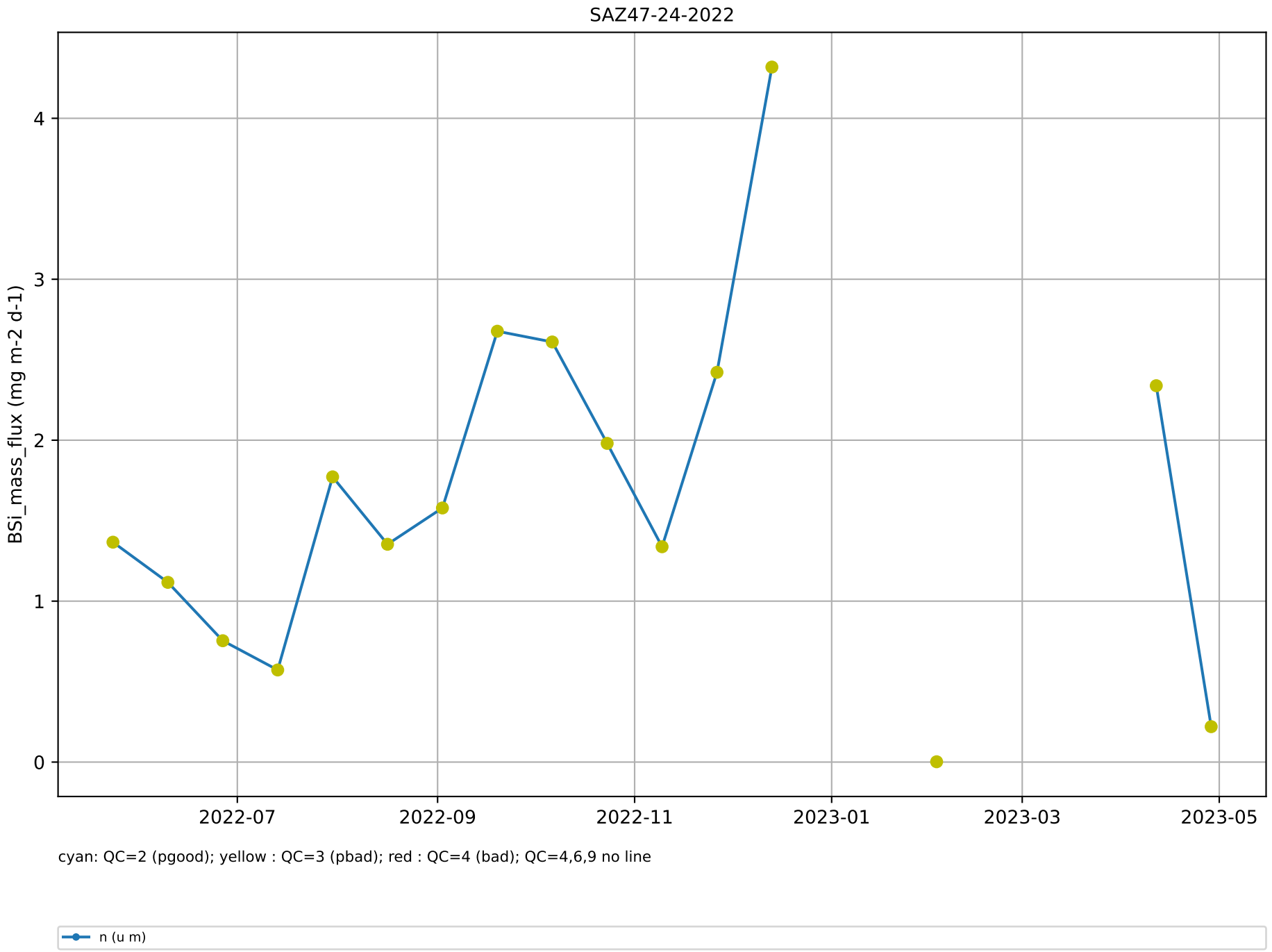
```
Variable : POC_mass_flux('TIME',)
_FillValue : nan
long_name : particulate organic carbon mass flux
units : mg m-2 d-1
relative_uncertainty : 0.028
comment : <1mm
comment_method : particulate total carbon minus particulate inorganic carbon
valid_min : -1.0
valid_max : 100.0
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH
ancillary_variables : POC_mass_flux_uncertainty POC_mass_flux_quality_control

AUX : POC_mass_flux_uncertainty('TIME',)
_FillValue : nan
units : mg m-2 d-1
long_name : uncertainty for particulate organic carbon mass flux

AUX : POC_mass_flux_quality_control('TIME',)
_FillValue : 127
long_name : quality flag for particulate organic carbon mass flux
quality_control_conventions : IMOS standard flags
valid_min : 0
valid_max : 9
flag_values : [0 1 2 3 4 9]
flag_meanings : unknown good_data probably_good_data probably_bad_data bad_data missing_value
```


SAZ47-24-2022
POC_mass_flux (mg m-2 d-1)
0
1
2
3
4
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
cyan: QC=2 (pgood); yellow : QC=3 (pbad); red : QC=4 (bad); QC=4,6,9 no line
n (u m)

```
Variable : PIC_mass_flux('TIME',)
_FillValue : nan
long_name : particulate inorganic carbon mass flux
units : mg m-2 d-1
relative_uncertainty : 0.019
comment : <1mm
comment_method : closed system acidification and coulometry of evolved carbon dioxide
valid_min : -1.0
valid_max : 100.0
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH
ancillary_variables : PIC_mass_flux_uncertainty PIC_mass_flux_quality_control

AUX : PIC_mass_flux_uncertainty('TIME',)
_FillValue : nan
units : mg m-2 d-1
long_name : uncertainty for particulate inorganic carbon mass flux

AUX : PIC_mass_flux_quality_control('TIME',)
_FillValue : 127
long_name : quality flag for particulate inorganic carbon mass flux
quality_control_conventions : IMOS standard flags
valid_min : 0
valid_max : 9
flag_values : [0 1 2 3 4 9]
flag_meanings : unknown good_data probably_good_data probably_bad_data bad_data missing_value
```


SAZ47-24-2022
PIC_mass_flux (mg m-2 d-1)
10
8
6
4
2
0
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
cyan: QC=2 (pgood); yellow : QC=3 (pbad); red : QC=4 (bad); QC=4,6,9 no line
n (u m)

```
Variable : BSi_mass_flux('TIME',)
_FillValue : nan
long_name : particulate biogenic silicon mass flux
units : mg m-2 d-1
relative_uncertainty : 0.049
comment : <1mm
comment_method : alkaline digest and segmented-flow spectrometry
valid_min : -1.0
valid_max : 100.0
coordinates : TIME LATITUDE LONGITUDE NOMINAL_DEPTH
ancillary_variables : BSi_mass_flux_uncertainty BSi_mass_flux_quality_control

AUX : BSi_mass_flux_uncertainty('TIME',)
_FillValue : nan
units : mg m-2 d-1
long_name : uncertainty for particulate biogenic silicon mass flux

AUX : BSi_mass_flux_quality_control('TIME',)
_FillValue : 127
long_name : quality flag for particulate biogenic silicon mass flux
quality_control_conventions : IMOS standard flags
valid_min : 0
valid_max : 9
flag_values : [0 1 2 3 4 9]
flag_meanings : unknown good_data probably_good_data probably_bad_data bad_data missing_value
```


SAZ47-24-2022
BSi_mass_flux (mg m-2 d-1)
0
1
2
3
4
2022-07
2022-09
2022-11
2023-01
2023-03
2023-05
cyan: QC=2 (pgood); yellow : QC=3 (pbad); red : QC=4 (bad); QC=4,6,9 no line
n (u m)