GHOST Standardised Metadata Definitions

Table of Contents

[PREFACE 1](#_Toc535247552)

[DEFINITION SYNTAX 1](#_Toc535247553)

[VARIABLE DEFINITIONS 1](#_Toc535247554)

[CORE VARIABLES 2](#_Toc535247555)

[NETWORK PROVIDED STATION INFORMATION 2](#_Toc535247556)

[NETWORK PROVIDED STANDARDISED CLASSIFICATIONS 10](#_Toc535247557)

[GLOBALLY GRIDDED CLASSIFICATIONS 12](#_Toc535247558)

[GLOBALLY GRIDDED PRODUCTS 16](#_Toc535247559)

[MEASUREMENT INFORMATION 24](#_Toc535247560)

[CONTACT INFORMATION 39](#_Toc535247561)

[TIMESTAMPS 41](#_Toc535247562)

[FURTHER DETAIL 42](#_Toc535247563)

# PREFACE

“Metadata” refers to data which provides qualitative information about measurements, in general across large swatches of time, but can vary.

# DEFINITION SYNTAX

**variable\_name:**

standard\_name:

long\_name:

units:

string\_format:

description:

# VARIABLE DEFINITIONS

## CORE VARIABLES

**GHOST\_version**

standard\_name: GHOST version

long\_name: Globally Harmonised Observational Surface Treatment (GHOST) version units: unitless

data\_type: unicode

string\_format: upper\_short

description: Version of the Globally Harmonised Observational Surface Treatment (GHOST).

**station\_reference**

standard\_name: station reference

long\_name: station reference identifier

units: unitless

data\_type: unicode

string\_format: upper\_short

description: reference ID for station.

## NETWORK PROVIDED STATION INFORMATION

**data\_timezone**

standard\_name: data timezone

long\_name: reported data timezone

units: difference in hours to UTC

data\_type: np.float32

string\_format: np.NaN

description: Timezone (relative to UTC) the data is reported in.

**station\_timezone**

standard\_name: station timezone

long\_name: station timezone

units: difference in hours to UTC

data\_type: np.float32,

string\_format: np.NaN

description: Actual timezone (relative to UTC in 2000-01-01 00:00) for the station

**latitude**

standard\_name: latitude

long\_name: latitude

units: decimal degrees North

data\_type: np.float64

string\_format: np.NaN

description: Geodetic latitude of measuring instrument, in decimal degrees North.

**longitude**

standard\_name: longitude

long\_name: longitude

units: decimal degrees East

data\_type: np.float64,

string\_format: np.NaN,

description: Geodetic longitude of measuring instrument, in decimal degrees East.

**altitude**

standard\_name: altitude

long\_name: altitude relative to mean sea level

units: m

data\_type: np.float32,

string\_format: np.NaN,

description: Altitude of the ground level at the station, relative to mean sea level, in metres.

**sampling\_height**

standard\_name: sampling height

long\_name: sampling height relative to ground

units: m

data\_type: np.float32

string\_format: np.NaN,

description: Height above the ground of the inlet/instrument/sampler, in metres.

**distance\_to\_building**

standard\_name: distance to building

long\_name: distance to the nearest building

units: m

data\_type: np.float32,

string\_format: np.NaN,

description: Distance to the nearest building of the inlet/instrument/sampler, in metres.

**distance\_to\_kerb**

standard\_name: distance to kerb

long\_name: distance to the street kerb

units: m

data\_type: np.float32

string\_format':np.NaN

description: Distance to the street kerb of the inlet/instrument/sampler, in metres.

**distance\_to\_junction**

standard\_name: distance to junction

long\_name: distance to the nearest road junction

units: m

data\_type: np.float32

string\_format: np.NaN

description: Distance to the nearest road junction of the inlet/instrument/sampler, in metres.

**distance\_to\_source**

standard\_name: distance to source

long\_name: distance to the main emission source

units: km

data\_type: np.float32,

string\_format: np.NaN

description: Distance to the main emission source (see variable: "main\_emission\_source") of the inlet/instrument/sampler, in kilometres.

**street\_width**

standard\_name: street width

long\_name: width of the street

units: m

data\_type: np.float32

string\_format: np.NaN

description: Width of the street where measurements are being made (if applicable), in metres.

**street\_type**

standard\_name: street type

long\_name: type of street

units: unitless

'data\_type':np.object,

'string\_format':'title\_short'

description: Type of street where measurements are being made (if applicable).

**daytime\_traffic\_speed**

standard\_name: daytime traffic speed

long\_name: average daytime speed of passing traffic

units: km hr-1

data\_type: np.float32

string\_format: np.NaN, '

description: Average daytime speed of the passing traffic where measurements are being made (if applicable), in kilometres per hour.

**daily\_passing\_vehicles**

standard\_name: daily passing vehicles

long\_name: average daily number of passing vehicles

units: unitless

data\_type: np.float32,

string\_format: np.NaN, '

description: Average number of vehicles passing daily.

**geodetic\_datum**

standard\_name: geodetic datum

long\_name: geodetic datum

units: unitless

data\_type: np.object

string\_format: upper\_short

description: Name of the geodetic datum used as the reference point for the mapping of latitude/longitude coordinates.

**projection**

standard\_name: projection

long\_name: projection

units: unitless

data\_type: np.object,

string\_format: upper\_short

description: Name of the map projection used for the flattening of the elipsoidal Earth onto a 2D plane.

**data\_level**

standard\_name: data level

long\_name: data level

units: unitless

data\_type: np.object

string\_format: upper\_short

description: Data level of data reported. This varies with network.

**climatology**

standard\_name: climatology

long\_name: climatology

units: unitless

data\_type:np.object

string\_format: upper\_short

description: Name of the climatology of which the observations pertain to.

**station\_name**

standard\_name: station name

long\_name: station name

units: unitless

data\_type: np.object,

string\_format: title\_short

description: Name of station where the measurement was conducted.

**city**

standard\_name: province

long\_name: province

units: unitless

data\_type: np.object

string\_format: title\_short

description: Name of the city the station is located in.

**province**

standard\_name: province

long\_name: province

units: unitless

data\_type: np.object

string\_format: title\_short

description: Name of the province the station is located in.

**county**

standard\_name: county

long\_name: county

units: unitless

data\_type: np.object

string\_format: title\_short

description: Name of the county the station is located in.

**country**

standard\_name: country

long\_name: country

units: unitless

data\_type: np.object,

string\_format: title\_short

description: Name of the country the station is located in.

**population**

standard\_name: population

long\_name: population

units: unitless

data\_type: np.float32

string\_format: np.NaN,

description: Population size of the nearest urban settlement.

**representative\_radius**

standard\_name: representative\_radius

long\_name: representative\_radius

units: km

data\_type: np.float32

string\_format: np.NaN

description: Radius of representativity of the measurements made (i.e. for what distance scale around the sampling point would the measurements be very similar?), given in kilometres. A quantitative version of the "measurement\_scale" classification.

**network**

standard\_name: network

long\_name: data network

units: unitless

data\_type: np.object

string\_format: upper\_short

description: The name of the network which reports data for the specific station in question.

**associated\_networks**

standard\_name: other associated networks

long\_name: other associated networks

units: unitless

data\_type: unicode,

string\_format: upper\_long,

description: String pair of associated network name and station reference. Format: network1:station\_reference1;network2:station\_reference2

## NETWORK PROVIDED STANDARDISED CLASSIFICATIONS

**standardised\_network\_provided\_area\_classification**

standard\_name: standardised network provided area classification

long\_name: standardised network provided area classification

units: unitless

data\_type: np.object,

string\_format: lower\_short

description: Standardised network provided classification, describing type of area a measurement station is situated in.

**standardised\_network\_provided\_station\_classification**

standard\_name: standardised network provided station classification

long\_name: standardised network provided station classification

units: unitless

data\_type: np.object,

string\_format: lower\_short,

description: Standardised network provided classification, categorising the type of air measured by a station.

**standardised\_network\_provided\_main\_emission\_source**

standard\_name: standardised network provided main emission source

long\_name: standardised network provided main emission source

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Standardised network provided classification, describing the main emission source influencing air measured at a station.

**standardised\_network\_provided\_land\_use**

standard\_name: standardised network provided land use

long\_name: standardised network provided land use type

units: unitless

data\_type:np.object

string\_format: lower\_short

description: Standardised network provided classification, describing the dominant land use in the area of the reporting station.

**standardised\_network\_provided\_terrain**

standard\_name: standardised network provided terrain

long\_name: standardised network provided terrain type

units: unitless

data\_type: np.object,

string\_format: lower\_short

description: Standardised network provided classification, describing the dominant terrain in the area of the reporting station.

**standardised\_network\_provided\_measurement\_scale**

standard\_name: standardised network provided measurement scale

long\_name: standardised network provided measurement scale

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Standardised network provided classification, a denotation of the geographic scope of the air quality measurements made.

## GLOBALLY GRIDDED CLASSIFICATIONS

**ESDAC\_Iwahashi\_landform\_classification**

standard\_name: ESDAC Iwahashi landform classification

long\_name: ESDAC Iwahashi landform classification

units: unitless

data\_type: np.object

string\_format: lower\_short

description: European Soil Data Centre (ESDAC) Iwahashi landform classification. The classification presents relief classes which are classified using an unsupervised nested-means algorithms and a three part geometric signature. Slope gradient, surface texture and local convexity are calculated based on the SRTM30 digital elevation model, within a given window size and classified according to the inherent data set properties. This is a dynamic landform classification method. Native resolution of 0.01 x 0.01 degrees.

**ESDAC\_modal\_Iwahashi\_landform\_classification\_5km**

standard\_name: ESDAC modal Iwahashi landform classification 5km

long\_name: ESDAC modal Iwahashi landform classification in 5km radius

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Modal European Soil Data Centre (ESDAC) Iwahashi landform classification in radius of 5km around station location.

**ESDAC\_modal\_Iwahashi\_landform\_classification\_25km**

standard\_name: ESDAC modal Iwahashi landform classification 25km

long\_name: ESDAC modal Iwahashi landform classification in 25km radius

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Modal European Soil Data Centre (ESDAC) Iwahashi landform classification in radius of 25km around station location.

**ESDAC\_Meybeck\_landform\_classification**

standard\_name: ESDAC Meybeck landform classification

long\_name: ESDAC Meybeck landform classification

units: unitless

data\_type: np.object

string\_format: lower\_short

description: European Soil Data Centre (ESDAC) Meybeck landform classification. The classification presents relief classes which are calculated based on the relief roughness. Roughness and elevation are classified based on a digital elevation model according to static thresholds, with a given window size. This is a static landform classification method. Native resolution of 0.01 x 0.01 degrees.

**ESDAC\_modal\_Meybeck\_landform\_classification\_5km**

standard\_name: ESDAC modal Meybeck landform classification 5km

long\_name: ESDAC modal Meybeck landform classification in 5km radius

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Modal European Soil Data Centre (ESDAC) Meybeck landform classification in radius of 5km around station location.

**ESDAC\_modal\_Meybeck\_landform\_classification\_25km**

standard\_name: ESDAC modal Meybeck landform classification 25km

long\_name: ESDAC modal Meybeck landform classification in 25km radius

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Modal European Soil Data Centre (ESDAC) Meybeck landform classification in radius of 25km around station location.

**Koppen-Geiger\_WorldClim\_classification**

standard\_name: Koppen-Geiger WorldClim classification

long\_name: Koppen-Geiger WorldClim classification

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Koppen-Geiger WorldClim classification, classifying the five main climate groups, with each group being divided based on seasonal precipitation and temperature patterns. Follows the rules defined in Kriticos et al. (2012) as applied to the 5’ resolution WorldClim global climatology (www.worldclim.org; Version 1.4, release 3; Hijmans et al. 2005), were downloaded from the CliMond set of climate data products (www.climond.org; Kriticos et al. 2012). Native resolution of 0.0833 x 0.0833 degrees.

**MODIS\_MCD12C1\_v6\_IGBP\_land\_use**

standard\_name: MODIS MCD12C1 v6 IGBP land use

long\_name: MODIS MCD12C1 v6 IGBP land use

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Land use from the Moderate Resolution Imaging Spectroradiometer (MODIS) Land Cover Climate Modeling Grid (CMG) MCD12C1 version 6, using the International Geosphere-Biosphere Programme (IGBP) classification. Native resolution of 0.05 x 0.05 degrees.'

**MODIS\_MCD12C1\_v6\_IGBP\_modal\_land\_use\_25km**

standard\_name: MODIS MCD12C1 v6 IGBP modal land use 25km

long\_name: MODIS MCD12C1 v6 IGBP modal land use in 25km radius

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Modal land use in radius of 25km around the station location from the Moderate Resolution Imaging Spectroradiometer (MODIS) Land Cover Climate Modeling Grid (CMG) MCD12C1 version 6, using the International Geosphere-Biosphere Programme (IGBP) classification.

**TEOW\_WWF\_classification**

standard\_name: TEOW WWF classification

long\_name: TEOW WWF classification

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Terrestrial Ecoregions of the World (TEOW) World Wildlife Foundation (WWF) classification. There are 867 terrestrial ecoregions, classified into 14 different biomes such as forests, grasslands, or deserts. Ecoregions represent the original distribution of distinct assemblages of species and communities. See citation: Olson, D. M., Dinerstein, E., Wikramanayake, E. D., Burgess, N. D., Powell, G. V. N., Underwood, E. C., DAmico, J. A., Itoua, I., Strand, H. E., Morrison, J. C., Loucks, C. J., Allnutt, T. F., Ricketts, T. H., Kura, Y., Lamoreux, J. F., Wettengel, W. W., Hedao, P., Kassem, K. R. 2001. Terrestrial ecoregions of the world: a new map of life on Earth. Bioscience 51(11):933-938.

**WMO\_region**

standard\_name: WMO region

long\_name: WMO region code

units: unitless

data\_type: np.object

string\_format: lower\_short

n\_decimals: np.NaN

metadata\_order: 44,

description: World Meteorological Organization (WMO) region of station, as integer: 1 (Africa), 2 (Asia), 3 (South America), 4 (Northern America, Central America and the Caribbean), 5 (South-West Pacific), 6 (Europe), 7 (Antarctica).

**UMBC\_anthrome\_classification**

standard\_name: UMBC anthrome classification

long\_name: UMBC anthrome classification

units: unitless

data\_type: np.object

string\_format: lower\_short

description: University of Maryland Baltimore County (UMBC) anthrome classification, describing the anthropogenic land use. Native resolution of 0.0833 x 0.0833 degrees.,

**UMBC\_modal\_anthrome\_classification\_25km**

standard\_name: UMBC modal anthrome classification 25km

long\_name: UMBC modal anthrome classification in 25km radius

units: unitless

data\_type: np.object

string\_format: lower\_short

description: University of Maryland Baltimore County (UMBC) modal anthrome classification in radius of 25km around station location.

## GLOBALLY GRIDDED PRODUCTS

**EDGAR\_v4.3.2\_annual\_average\_BC\_emissions**

standard\_name: EDGAR v4.3.2 annual average BC emissions

long\_name: EDGAR v4.3.2 annual average black carbon emissions

units: kg m-2 s-1

data\_type: np.float32

string\_format: np.NaN

description: EDGAR v4.3.2 annual average BC emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**EDGAR\_v4.3.2\_annual\_average\_CO\_emissions**

standard\_name: EDGAR v4.3.2 annual average CO emissions

long\_name: EDGAR v4.3.2 annual average carbon monoxide emissions

units: kg m-2 s-1

data\_type: np.float32

string\_format':np.NaN,

description: EDGAR v4.3.2 annual average CO emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**EDGAR\_v4.3.2\_annual\_average\_NH3\_emissions**

standard\_name: EDGAR v4.3.2 annual average NH3 emissions

long\_name: EDGAR v4.3.2 annual average ammonia emissions

units: kg m-2 s-1,

data\_type: np.float32

string\_format: np.NaN,

description: EDGAR v4.3.2 annual average NH3 emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**EDGAR\_v4.3.2\_annual\_average\_NMVOC\_emissions**

standard\_name: EDGAR v4.3.2 annual average NMVOC emissions long\_name: EDGAR v4.3.2 annual average non-methane volatile organic compound emissions

units: kg m-2 s-1

data\_type: np.float32

string\_format: np.NaN

description: EDGAR v4.3.2 annual average NMVOC emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**EDGAR\_v4.3.2\_annual\_average\_NOx\_emissions**

standard\_name: EDGAR v4.3.2 annual average NOx emissions

long\_name: EDGAR v4.3.2 annual average emissions of nitrogen oxides

units: kg m-2 s-1,

data\_type: np.float32

string\_format: np.NaN

description: EDGAR v4.3.2 annual average NOx emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**EDGAR\_v4.3.2\_annual\_average\_OC\_emissions**

standard\_name: EDGAR v4.3.2 annual average OC emissions

long\_name: EDGAR v4.3.2 annual average organic carbon emissions

units: kg m-2 s-1,

data\_type: np.float32

string\_format: np.NaN,

description: EDGAR v4.3.2 annual average OC emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**EDGAR\_v4.3.2\_annual\_average\_PM10\_emissions**

standard\_name: EDGAR v4.3.2 annual average PM10 emissions

long\_name: EDGAR v4.3.2 annual average PM10 emissions

units: kg m-2 s-1

data\_type: np.float32,

string\_format: np.NaN

description: EDGAR v4.3.2 annual average PM10 emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**EDGAR\_v4.3.2\_annual\_average\_biogenic\_PM2.5\_emissions**

standard\_name: EDGAR v4.3.2 annual average biogenic PM2.5 emissions

long\_name: EDGAR v4.3.2 annual average biogenic PM2.5 emissions

units: kg m-2 s-1

data\_type: np.float32

string\_format: np.NaN

description: EDGAR v4.3.2 annual average biogenic PM2.5 emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**EDGAR\_v4.3.2\_annual\_average\_fossilfuel\_PM2.5\_emissions**

standard\_name: EDGAR v4.3.2 annual average fossil fuel PM2.5 emissions

long\_name: EDGAR v4.3.2 annual average fossil fuel PM2.5 emissions

units: kg m-2 s-1

data\_type: np.float32,

string\_format':np.NaN,

description: EDGAR v4.3.2 annual average fossil fuel PM2.5 emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**EDGAR\_v4.3.2\_annual\_average\_SO2\_emissions**

standard\_name: EDGAR v4.3.2 annual average SO2 emissions

long\_name: EDGAR v4.3.2 annual average sulphur dioxide emissions

units: kg m-2 s-1

data\_type: np.float32

string\_format: np.NaN

description: EDGAR v4.3.2 annual average SO2 emissions, in kilograms per squared metre per second. Native resolution of 0.1 x 0.1 degrees.

**ETOPO1\_altitude**

standard\_name: ETOPO1 altitude

long\_name: ETOPO1 altitude, relative to sea level datum

units: m

data\_type: np.float32

string\_format: np.NaN

description':'Altitude from ETOPO1 digital elevation model, relative to sea level datum, in metres. Native resolution of 0.0166 x 0.0166 degrees. A correction for coastal sites is made: if the derived altitude is <= -5 m, the maximum altitude of the neighboring grid boxes will be used instead. If all neighboring grid boxes have altitudes <= -5 m, the original value will be retained.

**ETOPO1\_max\_altitude\_difference\_5km**

standard\_name: ETOPO1 max altitude difference 5km

long\_name: ETOPO1 maximum altitude difference between the ETOPO1\_altitude and all ETOPO1 altitudes in 5km radius

units: m

data\_type: np.float32

string\_format: np.NaN

description: Altitude difference between the ETOPO1\_altitude, and the minimum ETOP1 altitude in a radius of 5 km around the station location, in metres. A correction for coastal sites is made: if the derived altitude is <= -5 m, the maximum altitude of the neighboring grid boxes will be used instead. If all neighboring grid boxes have altitudes <= -5 m, the original value will be retained.

**GPW\_population\_density**

standard\_name: GPW population density

long\_name: GPW population density

units: xx km–2

data\_type: np.float32

string\_format: np.NaN

description: Gridded Population of the World (GPW), population density, in populus per squared kilometre, from either version 3 and 4 of the provided gridded datasets, dependent on the data year: v3 (1990-2000), v4 (2000-2015). Native resolution of 0.0416 x 0.0416 degrees.

**GPW\_average\_population\_density\_5km**

standard\_name: GPW average population density 5km

long\_name: GPW average population density in 5km radius

units: xx km–2

data\_type: np.float32

string\_format: np.NaN

description: Gridded Population of the World (GPW), average population density in a radius of 5 km around the station location.

**GPW\_average\_population\_density\_25km**

standard\_name: GPW average population density 25km

long\_name: GPW average population density in 25km radius

units: xx km–2,

data\_type: np.float32

string\_format: np.NaN

description: Gridded Population of the World (GPW), average population density in a radius of 25 km around the station location.

**GPW\_max\_population\_density\_5km**

standard\_name: GPW max population density 5km

long\_name: GPW average population density in 5km radius

units: xx km–2

data\_type:np.float32,

string\_format: np.NaN,

description: Gridded Population of the World (GPW), maximum population density in a radius of 5 km around the station location.

**GPW\_max\_population\_density\_25km**

standard\_name: GPW max population density 25km

long\_name: GPW average population density in 25km radius

units: xx km–2

data\_type: np.float32

string\_format: np.NaN

description: Gridded Population of the World (GPW), maximum population density in a radius of 25 km around the station location.

**NOAA-DMSP-OLS\_v4\_nighttime\_stable\_lights**

standard\_name: NOAA-DMSP-OLS v4 nighttime stable lights

long\_name: NOAA DMSP-OLS version 4 nighttime stable lights

units: unitless

data\_type: np.float32

string\_format: np.NaN,

description: National Oceanic and Atmospheric Administration (NOAA), Defense Meteorological Satellite Program - Operational Linescane System (DMSP-OLS) version 4 nighttime stable lights. Native resolution of 0.0083 x 0.0083 degrees. The values represent a brightness index ranging from 0 to 63. The sensor saturates at a value of 63.

**NOAA-DMSP-OLS\_v4\_average\_nighttime\_stable\_lights\_5km**

standard\_name: NOAA-DMSP-OLS v4 average nighttime stable lights 5km

long\_name: NOAA DMSP-OLS version 4 average nighttime stable lights in 5km radius

units: unitless

data\_type: np.float32

string\_format: np.NaN,

description: National Oceanic and Atmospheric Administration (NOAA), Defense Meteorological Satellite Program - Operational Linescane System (DMSP-OLS) version 4 average nighttime stable lights in 5km radius of measurement station. The values represent a brightness index ranging from 0 to 63. The sensor saturates at a value of 63.

**NOAA-DMSP-OLS\_v4\_average\_nighttime\_stable\_lights\_25km**

standard\_name: NOAA-DMSP-OLS v4 average nighttime stable lights 25km

long\_name: NOAA DMSP-OLS version 4 average nighttime stable lights in 25km radius

units: unitless

data\_type: np.float32

string\_format: np.NaN

description: National Oceanic and Atmospheric Administration (NOAA), Defense Meteorological Satellite Program - Operational Linescane System (DMSP-OLS) version 4 average nighttime stable lights in 25km radius of measurement station. The values represent a brightness index ranging from 0 to 63. The sensor saturates at a value of 63.

**NOAA-DMSP-OLS\_v4\_max\_nighttime\_stable\_lights\_5km**

standard\_name: NOAA-DMSP-OLS v4 max nighttime stable lights 5km

long\_name: NOAA DMSP-OLS version 4 maximum nighttime stable lights in 5km radius

units: unitless

data\_type: np.float32

string\_format: np.NaN

description: National Oceanic and Atmospheric Administration (NOAA), Defense Meteorological Satellite Program - Operational Linescane System (DMSP-OLS) version 4 maximum nighttime stable lights in 5km radius of measurement station. The values represent a brightness index ranging from 0 to 63. The sensor saturates at a value of 63.

**NOAA-DMSP-OLS\_v4\_max\_nighttime\_stable\_lights\_25km**

standard\_name: NOAA-DMSP-OLS v4 max nighttime stable lights 25km

long\_name: NOAA DMSP-OLS version 4 maximum nighttime stable lights in 25km radius

units: unitless

data\_type: np.float32

string\_format: np.NaN

description: National Oceanic and Atmospheric Administration (NOAA), Defense Meteorological Satellite Program - Operational Linescane System (DMSP-OLS) version 4 maximum nighttime stable lights in 25km radius of measurement station. The values represent a brightness index ranging from 0 to 63. The sensor saturates at a value of 63.

**OMI\_level3\_tropospheric\_column\_annual\_average\_NO2**

standard\_name: OMI level3 tropospheric column annual average NO2

long\_name: OMI level3 tropospheric column annual average nitrogen dioxide

units: xx m-2

data\_type: np.float32

string\_format: np.NaN

description: AURA Ozone monitoring instrument (OMI) level3 tropospheric column annual average NO2, in molecules per squared metres. Native resolution of 0.25 x 0.25 degrees.

**OMI\_level3\_tropospheric\_column\_cloud\_screened\_annual\_average\_NO2**

standard\_name: OMI level3 tropospheric column cloud screened annual average NO2

long\_name: OMI level3 tropospheric column cloud screened annual average nitrogen dioxide

units: xx m-2

data\_type: np.float32

string\_format: np.NaN,

description: AURA Ozone monitoring instrument (OMI) level3 tropospheric column cloud screened (where cloud fraction is less than 30 percent) annual average NO2, in molecules per squared metres. Native resolution of 0.25 x 0.25 degrees.

**GSFC\_coastline\_proximity**

standard\_name: GSFC coastline proximity

long\_name: GSFC proximity to the coastline

units: km

data\_type: np.float32

string\_format: np.NaN

description: Proximity to the coastline provided by the NASA Goddard Space Flight Center (GSFC) Ocean Color Group, in kilometres, produced using the Generic Mapping Tools package. Native resolution of 0.01 x 0.01 degrees. Negative distances represent locations over land (including land-locked bodies of water), while positive distances represent the ocean. There is an uncertainty of up to 1 km in the computed distance at any given point.

## MEASUREMENT INFORMATION

**primary\_sampling\_instrument\_name**

standard\_name: primary sampling instrument name

long\_name: standardised primary sampling instrument name

units: unitless

data\_type: np.object

string\_format: short

description: Standardised name of the primary sampling instrument (if no specific instrument is used, or known, this is the standardised primary sampling type).

**primary\_sampling\_type**

standard\_name: primary sampling type

long\_name: standardised primary sampling type

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Standardised primary sampling type.

**primary\_sampling\_instrument\_documented\_flow\_rate**

standard\_name: primary sampling instrument documented flow rate

long\_name: primary sampling instrument documented sampling flow rate

units: l min-1

data\_type: np.object

string\_format: lower\_short

description: Volume (litres) of fluid which passes to the primary sampling instrument, per unit time (minutes), as given in instrumental manual/documentation. Can be a range: e.g. 1.0-3.0.

**primary\_sampling\_instrument\_reported\_flow\_rate**

standard\_name: primary sampling instrument reported flow rate

long\_name: primary sampling instrument reported sampling flow rate

units: l min-1

data\_type: np.object

string\_format: lower\_short

description: Volume (litres) of fluid which passes to the primary sampling instrument, per unit time (minutes), as given in metadata. Can be a range: e.g. 1.0-3.0.

**primary\_sampling\_process\_details**

standard\_name: primary sampling process details

long\_name: primary sampling process details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Miscellaneous details regarding assumptions made in the standardisation of the primary sampling instrument/type.

**primary\_sampling\_instrument\_manual**

standard\_name: primary sampling instrument manual

long\_name: primary sampling instrument manual

units: unitless

data\_type: np.object,

string\_format: short

description: Path to the location in the esarchive of the manual for the specific primary sampling instrument.

**primary\_sampling\_further\_details**

standard\_name: primary sampling further details

long\_name: primary sampling further details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Further associated details regarding the specifics of the primary sampling instrument/type.

**sample\_preparation\_methodology\_names**

standard\_name: sample preparation methodology names

long\_name: standardised names of the sample preparation methodologies

units: unitless

data\_type: np.object

string\_format: short

description: Standardised names of all the sample preparation methodologies utilised in the measurement process. Mutiple names are separated by ";" (if no specific sample preparation method names are known/given, these are the standardised sample preparation method types).

**sample\_preparation\_methodology\_types**

standard\_name: sample preparation methodology types

long\_name: standardised types of the sample preparation methodologies

units: unitless

data\_type: np.object,

string\_format: lower\_short

description: Standardised types of all the sample preparation methodologies utilised in the measurement process. Mutiple types are separated by ";".

**sample\_preparation\_process\_details**

standard\_name':'sample preparation process details

long\_name: sample preparation process details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Miscellaneous details regarding assumptions made in the standardisation of the sample preparation methodologies. Multiple details regarding different methodologies are are separated by ";".

**sample\_preparation\_further\_details**

standard\_name: sample preparation further details

long\_name: sample preparation further details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Further associated details regarding the specifics of the sample preparation methodologies. Multiple details regarding different methodologies are are separated by ";".

**measuring\_instrument\_name**

standard\_name: measuring instrument name

long\_name: standardised measuring instrument name

units: unitless

data\_type: np.object

string\_format: short

description: Standardised name of the measuring instrument (if no specific instrument is used, or known, this is the standardised measurement methodology).

**measurement\_methodology**

standard\_name: measurement methodology

long\_name: standardised measurement methodology

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Standardised name of the measurement methodology.

**measuring\_instrument\_sampling\_type**

standard\_name: measuring instrument sampling type

long\_name: standardised sampling type of the measuring instrument

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Standardised name of the measuring instrument sampling type.

**measuring\_instrument\_documented\_flow\_rate**

standard\_name: measuring instrument documented flow rate

long\_name: measuring instrument documented flow rate

units: l min-1

data\_type: np.object

string\_format: lower\_short

description: Volume (litres) of fluid which passes to the measuring instrument, per unit time (minutes), as given in instrumental manual/documentation. Can be a range: e.g. 1.0-3.0.

**measuring\_instrument\_reported\_flow\_rate**

standard\_name: measuring instrument reported flow rate

long\_name: measuring instrument reported flow rate

units: l min-1

data\_type: np.object

string\_format: lower\_short

description: Volume (litres) of fluid which passes to the measuring instrument, per unit time (minutes), as given in metadata. Can be a range: e.g. 1.0-3.0.

**measuring\_instrument\_process\_details**

standard\_name: measuring instrument process details

long\_name: primary sampling process details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Miscellaneous details regarding assumptions made in the standardisation of the measuring instrument.

**measuring\_instrument\_manual\_name**

standard\_name: measuring instrument manual

long\_name: measuring instrument manual

units: unitless

data\_type: np.object

string\_format: short

description: Path to the location in the esarchive of the manual for the specific measuring instrument.

**measuring\_instrument\_further\_details**

standard\_name: measuring instrument further details

long\_name: measuring instrument further details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Further associated details regarding the specifics of the measuring instrument.

**measuring\_instrument\_reported\_units**

standard\_name: measuring instrument reported units

long\_name: measuring instrument reported measurement units

units: unitless

data\_type: np.object

string\_format: short

description: Units that the measured parameter are natively reported in.

**measuring\_instrument\_reported\_lower\_limit\_of\_detection**

standard\_name: measuring instrument reported lower limit of detection

long\_name: measuring instrument reported lower limit of detection

units: parameter\_details['standard\_units']

data\_type: np.float32

string\_format: np.NaN

description: Lower limit of detection of measurement methodology, as given in metadata.

**measuring\_instrument\_documented\_lower\_limit\_of\_detection**

standard\_name: measuring instrument documented lower limit of detection

long\_name: measuring instrument documented lower limit of detection

units: parameter\_details['standard\_units']

data\_type: np.float32

string\_format:np.NaN

description: Lower limit of detection of measurement methodology, as given in the instrumental manual/documentation.

**measuring\_instrument\_reported\_upper\_limit\_of\_detection**

standard\_name: measuring instrument reported upper limit of detection

long\_name: measuring instrument reported upper limit of detection

units: parameter\_details['standard\_units']

data\_type: np.float32

string\_format: np.NaN

description: Upper limit of detection of measurement methodology, as given in metadata.

**measuring\_instrument\_documented\_upper\_limit\_of\_detection**

standard\_name: measuring instrument documented upper limit of detection

long\_name: measuring instrument documented upper limit of detection

units: parameter\_details['standard\_units']

data\_type: np.float32

string\_format: np.NaN

description: Upper limit of detection of measurement methodology, as given in the instrumental manual/documentation.

**measuring\_instrument\_reported\_uncertainty**

standard\_name: measuring instrument reported measurement uncertainty

long\_name: measuring instrument reported measurement uncertainty

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Measurement uncertainty (±), as given in metadata. In principal this refers to the inherent uncertainty on every measurement as a function of the quadratic addition of the accuracy and precision metrics (at the same confidence interval), but is often reported incosistently e.g. being solely determined from random errors (i.e. just the measuremental precision). It can be given in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%); or a percentage quantity after a fixed limit (i.e. 0.5%>=50).

**measuring\_instrument\_documented\_uncertainty**

standard\_name: measuring instrument documented measurement uncertainty

long\_name: measuring instrument documented measurement uncertainty

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Measurement uncertainty (±), as given in the instrumental manual/documentation. In principal this refers to the inherent uncertainty on every measurement as a function of the quadratic addition of the accuracy and precision metrics (at the same confidence interval), but is often reported incosistently e.g. being solely determined from random errors (i.e. just the measuremental precision). This can be given in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%); or a percentage quantity after a fixed limit (i.e. 0.5%>=50).

**measuring\_instrument\_reported\_accuracy**

standard\_name: measuring instrument reported measurement accuracy

long\_name: measuring instrument reported measurement accuracy

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Measurement accuracy (±), as given in metadata. Accuracy describes the difference between the measurement and the actual value of the part that is measured. It includes: Bias (a measure of the difference between the true value and the observed value of a part -- If the “true” value is unknown, it can be calculated by averaging several measurements with the most accurate measuring equipment available) and Linearity (a measure of how the size of the part affects the bias of a measurement system -- It is the difference in the observed bias values through the expected range of measurement). This can be given as in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%); or a percentage quantity after a fixed limit (i.e. 0.5%>=50).

**measuring\_instrument\_documented\_accuracy**

standard\_name: measuring instrument documented measurement accuracy

long\_name: measuring instrument documented measurement accuracy

units: parameter\_details['standard\_units']

data\_type:np.object

string\_format: lower\_short

description: Measurement accuracy (±), as given in the instrumental manual/documentation. Accuracy describes the difference between the measurement and the actual value of the part that is measured. It includes: Bias (a measure of the difference between the true value and the observed value of a part -- If the “true” value is unknown, it can be calculated by averaging several measurements with the most accurate measuring equipment available) and Linearity (a measure of how the size of the part affects the bias of a measurement system -- It is the difference in the observed bias values through the expected range of measurement). This can be given as in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%); or a percentage quantity after a fixed limit (i.e. 0.5%>=50).

**measuring\_instrument\_reported\_precision**

standard\_name: measuring instrument reported measurement precision

long\_name: measuring instrument reported measurement precision

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Measurement precision (±), as given in metadata. Precision describes the variation you see when you measure the same part repeatedly with the same device. It includes the following two types of variation: Repeatability (variation due to the measuring device -- it is the variation observed when the same operator measures the same part repeatedly with the same device) and Reproducibility (variation due to the operators and the interaction between operator and part -- It is the variation of the bias observed when different operators measure the same parts using the same device). This can be given as in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%); or a percentage quantity after a fixed limit (i.e. 0.5%>=50).

**measuring\_instrument\_documented\_precision**

standard\_name: measuring instrument documented measurement precision

long\_name: measuring instrument documented measurement precision

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Measurement precision (±), as given in instrumental manual/documentation. Precision describes the variation you see when you measure the same part repeatedly with the same device. It includes the following two types of variation: Repeatability (variation due to the measuring device -- it is the variation observed when the same operator measures the same part repeatedly with the same device) and Reproducibility (variation due to the operators and the interaction between operator and part -- It is the variation of the bias observed when different operators measure the same parts using the same device). This can be given as in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%); or a percentage quantity after a fixed limit (i.e. 0.5%>=50).

**measuring\_instrument\_reported\_zero\_drift**

standard\_name: measuring instrument reported zero drift

long\_name: measuring instrument reported zero drift

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Zero drift of measuring instrument per unit of time, as given in metadata. Zero drift (or baseline drift) refers to the shifting of the whole calibration by the same amount caused by slippage or due to undue warming up of the electronic circuits. It is reported as the maximum possible drift per unit of time in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%/day); or a percentage quantity after a fixed limit (i.e. 0.5%>=50/day).

**measuring\_instrument\_documented\_zero\_drift**

standard\_name: measuring instrument documented zero drift

long\_name: measuring instrument documented zero drift

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Zero drift of measuring instrument per unit of time, as given in instrumental manual/documentation. Zero drift (or baseline drift) refers to the shifting of the whole calibration by the same amount caused by slippage or due to undue warming up of the electronic circuits. It is reported as the maximum possible drift per unit of time in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%/day); or a percentage quantity after a fixed limit (i.e. 0.5%>=50/day).

**measuring\_instrument\_reported\_span\_drift**

standard\_name: measuring instrument reported span drift

long\_name: measuring instrument reported span drift

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Span drift of measuring instrument per unit of time, as given in metadata. Span drift (or sensitivity drift) refers to when there is proportional change in the indication of an instrument all along the upward scale, hence higher calibrations end up being shifted more than lower calibrations. It is reported as the maximum possible drift per unit of time in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%/day); or a percentage quantity after a fixed limit (i.e. 0.5%>=50/day).

**measuring\_instrument\_documented\_span\_drift**

standard\_name: measuring instrument documented span drift

long\_name: measuring instrument documented span drift

units: parameter\_details['standard\_units']

data\_type: np.object,

string\_format: lower\_short

description: Span drift of measuring instrument per unit of time, as given in instrumental manual/documentation. Span drift (or sensitivity drift) refers to when there is proportional change in the indication of an instrument all along the upward scale, hence higher calibrations end up being shifted more than lower calibrations. It is reported as the maximum possible drift per unit of time in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%/day); or a percentage quantity after a fixed limit (i.e. 0.5%>=50/day).

**measuring\_instrument\_reported\_zonal\_drift**

standard\_name: measuring instrument reported zonal drift

long\_name: measuring instrument reported zonal drift

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Zonal drift of measuring instrument per unit of time, as given in metadata. Zonal drift refers to when drift occurs only over a portion of the full scale or span of an instrument, while the remaining portion of the scale remains unaffected. It is reported as the maximum possible drift per unit of time in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%/day); or a percentage quantity after a fixed limit (i.e. 0.5%>=50/day).

**measuring\_instrument\_documented\_zonal\_drift**

standard\_name: measuring instrument documented zonal drift

long\_name: measuring instrument documented zonal drift

units: parameter\_details['standard\_units']

data\_type: np.object

string\_format: lower\_short

description: Zonal drift of measuring instrument per unit of time, as given in instrumental manual/documentation. Zonal drift refers to when drift occurs only over a portion of the full scale or span of an instrument, while the remaining portion of the scale remains unaffected. It is reported as the maximum possible drift per unit of time in absolute terms; as a percentage; the greater of either an absolute value or percentage (i.e. 25.0/0.5%/day); or a percentage quantity after a fixed limit (i.e. 0.5%>=50/day).

**measuring\_instrument\_reported\_measurement\_resolution**

standard\_name: measuring instrument reported measurement resolution

long\_name: measuring instrument reported measurement resolution

units: parameter\_details['standard\_units']

data\_type: np.float32

string\_format: np.NaN

description: Measurement resolution, as given in metadata. The measurement resolution is defined as the smallest change or increment in the measured quantity that the instrument can detect. However it is often reported inconsistently, often being simply the number of digits an instrument can display, which does not relate to the actual physical resolution of the instrument.

**measuring\_instrument\_documented\_measurement\_resolution**

standard\_name: measuring instrument documented measurement resolution

long\_name: measuring instrument documented measurement resolution

units: parameter\_details['standard\_units']

data\_type: np.float32

string\_format: np.NaN

description: Measurement resolution, as given in instrumental manual/documentation. The measurement resolution is defined as the smallest change or increment in the measured quantity that the instrument can detect. However it is often reported inconsistently, often being simply the number of digits an instrument can display, which does not relate to the actual physical resolution of the instrument.

**measuring\_instrument\_reported\_absorption\_cross\_section**

standard\_name: measuring instrument reported absorption cross section

long\_name: measuring instrument reported absorption cross section

units: cm2

data\_type: np.object

string\_format: lower\_short

description: Assumed molecule cross-section for parameter being measured (in cm2/molecule), as given in metadata. This field is only used for parameters being measured using optical methods, where a molecule cross section is assumed for processing the measurement values. Physically it is the effective area of the molecule that photon needs to traverse in order to be absorbed. The larger the absorption cross section, the easier it is to photoexcite the molecule. Can be a range: e.g. 1e-15-1.5e-15.

**measuring\_instrument\_documented\_absorption\_cross\_section**

standard\_name: measuring instrument documented absorption cross section

long\_name: measuring instrument documented absorption cross section

units: cm2

data\_type: np.object

string\_format: lower\_short

description: Assumed molecule cross-section for parameter being measured (in cm2/molecule), as given in instrumental manual/documentation. This field is only used for parameters being measured using optical methods, where a molecule cross section is assumed for processing the measurement values. Physically it is the effective area of the molecule that photon needs to traverse in order to be absorbed. The larger the absorption cross section, the easier it is to photoexcite the molecule. Can be a range: e.g. 1e-15-1.5e-15.

**measuring\_instrument\_inlet\_information**

standard\_name: measuring instrument inlet information

long\_name: measuring instrument measurement inlet information

units: unitless

data\_type: np.object,

string\_format: lower\_long

description: Description of sampling inlet of the measuring instrument.

**measuring\_instrument\_volume\_standard\_temperature**

standard\_name: measuring instrument volume standard temperature

long\_name: measuring instrument volume standard temperature

units: K

data\_type: np.float64

string\_format: np.NaN

description: The temperature (in Kelvin) which has been used for normalising gas volume concentrations. This temperature refers to the bench temperature of the measuring instrument at time of measurement. Normalisation is typically done in-instrument to a fixed standard temperature and pressure. If this is not reported by the data provider, then this is assumed to be the known network standard temperature.

**measuring\_instrument\_volume\_standard\_pressure**

standard\_name: measuring instrument volume standard pressure

long\_name: measuring instrument volume standard pressure

units: hPa

data\_type: np.float64

string\_format: np.NaN

description: The pressure (in hPa) which has been used for normalising gas volume concentrations. This pressure refers to the internal pressure of the measuring instrument at time of measurement. Normalisation is typically done in-instrument to a fixed standard temperature and pressure. If this is not reported by the data provider, then this is assumed to be the known network standard pressure.

**measuring\_instrument\_calibration\_scale**

standard\_name: measuring instrument calibration scale

long\_name: measuring instrument calibration scale name

units: unitless

data\_type: np.object

string\_format: upper\_short

description: Name of calibration scale used for the calibration of the measuring instrument.

**measuring\_instrument\_europe\_reference\_equivalence\_status**

standard\_name: measuring instrument Europe reference equivalence status

long\_name: standardised measuring instrument Europe reference equivalence status

units: unitless

data\_type:np.object

string\_format: lower\_short

description: Standardised status that shows if the the utilised measuring instrument has been proven to produce equivalent measurements as the reference measurement methodology as defined by the European Parliament. The reference methods are defined in the European directives here: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0050&from=en and here: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004L0107&from=EN . This can be 1 of 5 standardised options (or NaN if measurement method unknown): reference (the methodology used is excatly that of the reference), equivalent (the methodology has been proven to be equivalent to the reference), not\_equivalent (the methodology has not been proven, or attempted, to be equivalent to the reference), no\_reference (there exists no reference method for the parameter measured), testing (the methodology is currently been tested to see if it is equivalent to the reference).

**measuring\_instrument\_us\_reference\_equivalence\_status**

standard\_name: measuring instrument US reference equivalence status

long\_name: standardised measuring instrument US reference equivalence status units: unitless

data\_type: np.object

string\_format: lower\_short

description: Standardised status that shows if the the utilised measuring instrument has been proven to produce equivalent measurements as the reference measurement methodology as defined by the United States government. The list of designated reference and equilalent methods is given here: https://www.epa.gov/sites/production/files/2018-01/documents/amtic\_list\_dec\_2017\_update\_1-20-2018\_0.pdf .This can be 1 of 7 standardised options (or NaN if measurement method unknown): reference (the methodology used is excatly that of the reference), equivalent (the methodology has been proven to be equivalent to the reference), not\_equivalent (the methodology has not been proven, or attempted, to be equivalent to the reference), no\_reference (there exists no reference method for the parameter measured), testing (the methodology is currently been tested to see if it is equivalent to the reference), assume\_equivalent (no information is found about the specific instrument regarding its reference equivalence status, common sense suggests the method it uses is reference equivalent), assume\_not\_equivalent (no information is found about the specific instrument regarding its reference equivalence status, common sense suggests the method it uses is not reference equivalent), assume\_reference (no information is found about the specific instrument regarding its reference equivalence status, common sense suggests the method it uses is equal to the reference method.

## CONTACT INFORMATION

**principal\_investigator\_name**

standard\_name: principal investigator name

long\_name: principal investigator name

units: unitless

data\_type: np.object

string\_format: title\_short

description: Full name of the principal scientific investigator for the specific reported data.

**principal\_investigator\_institution**

standard\_name: principal investigator institution

long\_name: principal investigator institution

units: unitless

data\_type: np.object

string\_format: title\_short

description: Institution of the principal scientific investigator for the specific reported data.'

**principal\_investigator\_email\_address**

standard\_name: principal investigator email address

long\_name: principal investigator email address

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Email address of the principal scientific investigator for the specific reported data.

**contact\_name**

standard\_name: contact name

long\_name: contact name

units: unitless

data\_type:np.object

string\_format: title\_short

description: Full name of the principal data contact for the specific reported data.

**contact\_institution**

standard\_name: contact institution

long\_name: contact institution

units: unitless

data\_type: np.object

string\_format: title\_short

description: Institution of the principal data contact for the specific reported data.

**contact\_email\_address**

standard\_name: contact email address

long\_name: contact email address

units: unitless

data\_type: np.object

string\_format: lower\_short

description: Email address of the principal data contact for the specific reported data.

## TIMESTAMPS

**meta\_update\_stamp**

standard\_name: metdata update timestamp

long\_name: metdata update timestamp

units: unitless

data\_type: np.uint32

string\_format: np.NaN

description: Time stamp of metadata updates in integer minutes from 0001-01-01 00:00 UTC.

**data\_download\_stamp**

standard\_name: data download timestamp

long\_name: data download timestamp

units: unitless

data\_type: np.uint32

string\_format: np.NaN

description: Time stamp of date/time of data download in integer minutes from 0001-01-01 00:00 UTC.

## FURTHER DETAIL

**network\_sampling\_details**

standard\_name: network sampling details

long\_name: network sampling details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Extra details provided by the reporting network about the sampling methods employed.

**network\_uncertainty\_details**

standard\_name: network uncertainty details

long\_name: network uncertainty details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Extra details provided by the reporting network about the uncertainties involved with the measurement methods employed.

**network\_maintenance\_details**

standard\_name: network maintenance details

long\_name: network maintenance details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Extra details provided by the reporting network about the operational maintenance done at the station.

**network\_qa\_details**

standard\_name: network qa details

long\_name: network qa details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Extra details provided by the reporting network about the in-network quality assurance of measurements.

**network\_miscellaneous\_details**

standard\_name: network miscellaneous details

long\_name: network miscellaneous details

units: unitless

data\_type: np.object

string\_format: lower\_long

description: Extra miscellanous details provided by the reporting network.