ATL23 Product Data Dictionary

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description	(Attribute)	The ATL23 product contains Sea Surface Height (SSH) of the mid latitudes, northern and southern polar regions based on 3 months of data coverage.
level	(Attribute)	L3B
short_name	(Attribute)	ATL23
title	(Attribute)	SET_BY_META
Group: /		The ATL23 product contains Sea Surface Height (SSH) of the mid latitudes, northern and southern polar regions based on 3 months of data coverage.
Conventions	(Attribute)	CF-1.6
citation	(Attribute)	SET_BY_META
contributor_name	(Attribute)	Thomas A Neumann (thomas.neumann@nasa.gov), Thorsten Markus (thorsten.markus@nasa.gov), Suneel Bhardwaj (suneel.bhardwaj@nasa.gov) David W Hancock III (david.w.hancock@nasa.gov)
contributor_role	(Attribute)	Instrument Engineer, Investigator, Principle Investigator, Data Producer, Data Producer
creator_name	(Attribute)	SET_BY_META
date_created	(Attribute)	SET_BY_PGE
date_type	(Attribute)	UTC
geospatial_lat_max	(Attribute)	0.0
geospatial_lat_min	(Attribute)	0.0
geospatial_lat_units	(Attribute)	degrees_north
geospatial_lon_max	(Attribute)	0.0
geospatial_lon_min	(Attribute)	0.0
geospatial_lon_units	(Attribute)	degrees_east
granule_type	(Attribute)	ATL23
hdfversion	(Attribute)	SET_BY_PGE
history	(Attribute)	SET_BY_PGE
identifier_file_uuid	(Attribute)	SET_BY_PGE
identifier_product_doi	(Attribute)	10.5067/ATLAS/ATL19.001
identifier_product_doi_authority	(Attribute)	http://dx.doi.org
identifier_product_format_version	(Attribute)	SET_BY_PGE
identifier_product_type	(Attribute)	ATL23
institution	(Attribute)	SET_BY_META
instrument	(Attribute)	SET_BY_META
keywords	(Attribute)	SET_BY_META
keywords_vocabulary	(Attribute)	SET_BY_META
license	(Attribute)	Data may not be reproduced or distributed without including the citation for this product included in this metadata. Data may not be distributed in an altered form without the written permission of the ICESat-2 Science Project Office at NASA/GSFC.
naming_authority	(Attribute)	http://dx.doi.org
platform	(Attribute)	SET_BY_META
processing_level	(Attribute)	L3B
project	(Attribute)	SET_BY_META
publisher_email	(Attribute)	SET_BY_META
publisher_name	(Attribute)	SET_BY_META
publisher_url	(Attribute)	SET_BY_META
references	(Attribute)	SET_BY_META
source	(Attribute)	SET_BY_META
spatial_coverage_type	(Attribute)	Horizontal
standard_name_vocabulary	(Attribute)	CF-1.6
summary	(Attribute)	SET_BY_META
time_coverage_duration	(Attribute)	SET_BY_PGE
time_coverage_end	(Attribute)	SET_BY_PGE
time_coverage_start	(Attribute)	SET_BY_PGE

time_type	(Attribute)	CCSDS UTC-A		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
delta_time_beg COMPACT	DOUBLE(1) INVALID_R8B	Beginning elapsed GPS seconds None	seconds	Beginning elapsed GPS seconds (Source: Ocean ATBD)
delta_time_end COMPACT	DOUBLE(1) INVALID_R8B	Ending elapsed GPS seconds None	seconds	Ending elapsed GPS seconds (Source: Ocean ATBD)
ds_hist_bincenters CHUNKED	DOUBLE(:)	DOT histogram bincenters grid_dot	meters	Grid dimension for dot_hist_grid. (Source: Ocean ATBD)
axis	(Attribute)	grid_dot		
grid_mapping	(Attribute)	crs		
ds_surf_type COMPACT	INTEGER(5)	Surface Type Dimension Scale surf_type	1	Dimension scale indexing the surface type array. Index=1 corresponds to Land; index = 2 corresponds to Ocean; Index = 3 corresponds to Sealce; Index=4 corresponds to LandIce; Index=5 corresponds to InlandWater (Source: ATL19 ATBD); (Meanings: [1 2 3 4 5]) (Values: ['land', 'ocean', 'seaice', 'landice', 'inland_water'])
axis	(Attribute)	surf_type		
grid_mapping	(Attribute)	crs		
Group: /ancillary_data		Contains information ancillary to the data product. This may include product characteristics, instrument characteristics and/or processing constants.		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
atlas_sdp_gps_epoch COMPACT	DOUBLE(1)	ATLAS Epoch Offset None	seconds since 1980-01-06T00:00:00.000000Z	Number of GPS seconds between the GPS epoch (1980-01-06T00:00:00.000000Z UTC) and the ATLAS Standard Data Product (SDP) epoch (2018-01-01:T00.00.00.000000 UTC). Add this value to delta time parameters to compute full gps_seconds (relative to the GPS epoch) for each data point. (Source: Operations)
control CONTIGUOUS	STRING(1)	Control File None	1	PGE-specific control file used to generate this granule. To re-use, replace breaks (BR) with linefeeds. (Source: Operations)
data_end_utc COMPACT	STRING(1)	End UTC Time of Granule (CCSDS-A, Actual) None	1	UTC (in CCSDS-A format) of the last data point within the granule. (Source: Derived)
data_start_utc COMPACT	STRING(1)	Start UTC Time of Granule (CCSDS-A, Actual) None	1	UTC (in CCSDS-A format) of the first data point within the granule. (Source: Derived)
end_cycle COMPACT	INTEGER(1)	Ending Cycle None	1	The ending cycle number associated with the data contained within this granule. The cycle number is the counter of the number of 91-day repeat cycles completed by the mission. (Source: Derived)
end_delta_time COMPACT	DOUBLE(1)	ATLAS End Time (Actual) time	seconds since 2018-01-01	Number of GPS seconds since the ATLAS SDP epoch at the last data point in the file. The ATLAS Standard Data Products (SDP) epoch offset is defined within /ancillary_data/atlas_sdp_gps_epoch as the number of GPS seconds between the GPS epoch (1980-01-06T00:00:00.000000Z UTC) and the ATLAS SDP epoch. By adding the offset contained within atlas_sdp_gps_epoch to delta time parameters, the time in gps_seconds relative to the GPS epoch can be computed. (Source: Derived)
end_geoseg COMPACT	INTEGER(1)	Ending Geolocation Segment None	1	The ending geolocation segment number associated with the data contained within this granule. ICESat granule geographic regions are further refined by geolocation segments. During the geolocation process, a geolocation segment is created approximately every 20m from the start of the orbit to the end. The geolocation segments help align the ATLAS strong a weak beams and provide a common segment length for the L2 and higher products. The geolocation segment indices differ slightly from orbit-to-orbit because of the irregular shape of the Earth. The geolocation segment indices on ATL01 and ATL02 are only approximate because beams have not been aligned at the time of their creation. (Source: Derived)
end_gpssow COMPACT	DOUBLE(1)	Ending GPS SOW of Granule (Actual) None	seconds	GPS seconds-of-week of the last data point in the granule. (Source: Derived)
end_gpsweek COMPACT	INTEGER(1)	Ending GPSWeek of Granule (Actual) None	weeks from 1980-01-06	GPS week number of the last data point in the granule. (Source: Derived)
end_orbit COMPACT	INTEGER(1)	Ending Orbit Number None	1	The ending orbit number associated with the data contained within this granule. The orbit number increments each time the spacecraft completes a full orbit of the Earth. (Source: Derived)
end_region COMPACT	INTEGER(1)	Ending Region None	1	The ending product-specific region number associated with the data contained within this granule. ICESat-2 data products are separated by geographic regions. The data contained within a specific region are the same for ATL01 and ATL02. ATL03 regions differ slightly because of different geolocation segment locations caused by the irregular shape of the Earth. The region indices for other products are completely independent. (Source: Derived)
end_rgt COMPACT	INTEGER(1)	Ending Reference Groundtrack None	1	The ending reference groundtrack (RGT) number associated with the data contained within this granule. There are 1387 reference groundtrack in the ICESat-2 repeat orbit. The reference groundtrack increments each time the spacecraft completes a full orbit of the Earth and resets to 1 each time the spacecraft completes a full cycle. (Source: Derived)
granule_end_utc COMPACT	STRING(1)	End UTC Time of Granule (CCSDS-A, Requested) None	1	Requested end time (in UTC CCSDS-A) of this granule. (Source: Derived)
granule_start_utc	STRING(1)	Start UTC Time of	1	Requested start time (in UTC CCSDS-A) of this granule.

COMPACT		Granule (CCSDS-A, Requested) None		(Source: Derived)
qa_at_interval COMPACT	DOUBLE(1)	QA Along-Track Interval None	1	Statistics time interval for along-track QA data. (Source: control)
release COMPACT	STRING(1)	Release Number None	1	Release number of the granule. The release number is incremented when the software or ancillary data used to create the granule has been changed. (Source: Operations)
start_cycle COMPACT	INTEGER(1)	Starting Cycle None	1	The starting cycle number associated with the data contained within this granule. The cycle number is the counter of the number of 91-day repeat cycles completed by the mission. (Source: Derived)
start_delta_time COMPACT	DOUBLE(1)	ATLAS Start Time (Actual) time	seconds since 2018-01-01	Number of GPS seconds since the ATLAS SDP epoch at the first data point in the file. The ATLAS Standard Data Products (SDP) epoch offset is defined within /ancillary_data/atlas_sdp_gps_epoch as the number of GPS seconds between the GPS epoch (1980-01-06T00:00:00.000000Z UTC) and the ATLAS SDP epoch. By adding the offset contained within atlas_sdp_gps_epoch to delta time parameters, the time in gps_seconds relative to the GPS epoch can be computed. (Source: Derived)
start_geoseg COMPACT	INTEGER(1)	Starting Geolocation Segment None	1	The starting geolocation segment number associated with the data contained within this granule. ICESat granule geographic regions are further refined by geolocation segments. During the geolocation process, a geolocation segment is created approximately every 20m from the start of the orbit to the end. The geolocation segments help align the ATLAS strong a weak beams and provide a common segment length for the L2 and higher products. The geolocation segment indices differ slightly from orbit-to-orbit because of the irregular shape of the Earth. The geolocation segment indices on ATL01 and ATL02 are only approximate because beams have not been aligned at the time of their creation. (Source: Derived)
start_gpssow COMPACT	DOUBLE(1)	Start GPS SOW of Granule (Actual) None	seconds	GPS seconds-of-week of the first data point in the granule. (Source: Derived)
start_gpsweek COMPACT	INTEGER(1)	Start GPSWeek of Granule (Actual) None	weeks from 1980-01-06	GPS week number of the first data point in the granule. (Source: Derived)
start_orbit COMPACT	INTEGER(1)	Starting Orbit Number None	1	The starting orbit number associated with the data contained within this granule. The orbit number increments each time the spacecraft completes a full orbit of the Earth. (Source: Derived)
start_region COMPACT	INTEGER(1)	Starting Region None	1	The starting product-specific region number associated with the data contained within this granule. ICESat-2 data products are separated by geographic regions. The data contained within a specific region are the same for ATL01 and ATL02. ATL03 regions differ slightly because of different geolocation segment locations caused by the irregular shape of the Earth. The region indices for other products are completely independent. (Source: Derived)
start_rgt COMPACT	INTEGER(1)	Starting Reference Groundtrack None	1	The starting reference groundtrack (RGT) number associated with the data contained within this granule. There are 1387 reference groundtrack in the ICESat-2 repeat orbit. The reference groundtrack increments each time the spacecraft completes a full orbit of the Earth and resets to 1 each time the spacecraft completes a full cycle. (Source: Derived)
version COMPACT	STRING(1)	Version None	1	Version number of this granule within the release. It is a sequential number corresponding to the number of times the granule has been reprocessed for the current release. (Source: Operations)
Group: /ancillary_data/ocean		Contains general ancillary parameters.		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
9ctr COMPACT	INTEGER(1)	Use cell and surrounding 8 cells None	1	Process data within the grid cell and the surrounding 8 grid cells. 1=true (default), 0=false (Source: Ocean ATBD); (Meanings: [1 0]) (Values: ['true', 'false'])
grid_lat_size COMPACT	DOUBLE(1)	Latitude Grid Cell Size None	degrees north	The size, in degrees, of each latitude step. (Source: Operations)
grid_lon_size COMPACT	DOUBLE(1)	Longitude Grid Cell Size None	degrees east	The size, in degrees, of each longitude step. (Source: Operations)
grid_xy_size COMPACT	DOUBLE(1)	X and Y Grid Cell Size None	meters	The size, in meters, of each x or y step. (Source: Operations)
hist_bin_size COMPACT	DOUBLE(1)	Histogram Bin Size None	meters	Dot histogram bin size in meters. (Source: Operations)
hist_bot COMPACT	DOUBLE(1)	Histogram Bottom None	meters	Bottom (minimum height) of histograms. (Source: Operations)
hist_nbins COMPACT	INTEGER(1)	Number of histogram bins. None	counts	Number of bins in each histogram. (Source: Derived)
hist_top COMPACT	DOUBLE(1)	Histogram Top None	meters	Top (maximum height) of histograms. (Source: Operations)
midlat_max_avgcntr_uncrtn COMPACT	DOUBLE(1)	Max midlat_dot_avgcntr uncertaintity None	meters	Set midlat_dot_avgcntr and midlat_ssb_avgcntr invalid if midlat_dot_avgcntr_uncrtn is greater than this. (Source: Ocean ATBD)
midlat_max_dfwcntr_uncrtn COMPACT	DOUBLE(1)	Max midlat_dot_dfwcntr uncertaintity None	meters	Set midlat_dot_dfwcntr and midlat_ssb_avgcntr invalid if midlat_dot_dfwcntr_uncrtn is greater than this. (Source: Ocean ATBD)
min_n_ocsegs COMPACT	INTEGER_8(1)	Min ocean segments for processing None	1	Process data if it contains data from a number of ocean segments greater than or equal to this. (Source: Ocean ATBD)

min_n_ocsegs4cntr COMPACT	INTEGER_8(1)	Min ocean segments for calculating center values None	1	Interpolate data to the center of a grid cell if it contains data from a number of ocean segments greater than or equal to this. (Source: Ocean ATBD)
min_n_orbits COMPACT	INTEGER(1)	Min orbits for processing None	1	Process data for center values if it contains data from a number of orbits greater than or equal to this. (Source: Ocean ATBD)
npolar_max_avgcntr_uncrtn COMPACT	DOUBLE(1)	Max npolar_dot_avgcntr uncertaintity None	meters	Set npolar_dot_avgcntr and npolar_ssb_avgcntr invalid if npolar_dot_avgcntr_uncrtn is greater than this. (Source: Ocean ATBD)
npolar_max_dfwcntr_uncrtn COMPACT	DOUBLE(1)	Max npolar_dot_dfwcntr uncertaintity None	meters	Set npolar_dot_dfwcntr and npolar_ssb_dfwcntr invalid if npolar_dot_dfwcntr_uncrtn is greater than this. (Source: Ocean ATBD)
ocscan_time1 COMPACT	DOUBLE(1)	Ocean scan time None	seconds	If control podppd_edit =0 then before ocscan_time1 ATL23 uses ATL12 ocean segments with podppd_flag_seg = 0 or 4 and after ocscan_time1 ATL23 uses ATL12 ocean segments with podppd_flag_seg = 0. Ocscan_time1 is in GPS seconds since the ATLAS Standard Data Products (SDP) epoch (same as delta_time). The ATLAS SDP epoch offset is defined within /ancillary_data/atlas_sdp_gps_epoch as the number of GPS seconds between the GPS epoch (1980-01-06T00:00:00.000000Z UTC) and the ATLAS SDP epoch. By adding the offset contained within atlas_sdp_gps_epoch to ocscan_time1, the time in gps_seconds relative to the GPS epoch can be computed. (Source: Operations)
podppd_edit COMPACT	INTEGER_1(1)	podppd_edit None	1	Control to filter use of ATL12 ocean segments based on ATL12 podppd_flag_seg values. 0 - use podppd = 0 and 4 before ATL19_OCSCAN_TIME1, use only podppd = 0 at or after; 1 - use only podppd = 0; 2 - use both podppd = 0 and 4 (Source: Control File Override); (Meanings: [0 1 2]) (Values: ['use_0_4_before_ocscan_time1', 'use_only_0', 'use_0_and_4'])
spolar_max_avgcntr_uncrtn COMPACT	DOUBLE(1)	Max spolar_dot_avgcntr uncertaintity None	meters	Set spolar_dot_avgcntr and spolar_ssb_avgcntr invalid if spolar_dot_avgcntr_uncrtn is greater than this. (Source: Ocean ATBD)
spolar_max_dfwcntr_uncrtn COMPACT	DOUBLE(1)	Max spolar_dot_dfwcntr uncertaintity None	meters	Set spolar_dot_dfwcntr and spolar_ssb_dfwcntr invalid if spolar_dot_dfwcntr_uncrtn is greater than this. (Source: Ocean ATBD)
use_all_beams COMPACT	INTEGER_1(1)	use_all_beams None	1	0 - Use only strong beams; 1 - use all beams. (Source: Control File Override); (Meanings: [0 1]) (Values: ['use_3_strong_beams', 'use_all_6_beams'])
Group: /mid_latitude		This group contains the mid_latitude grids.		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
a_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Planar fit a coefficient None	meters/degree	The a coefficient of the planar fit used to compute dot_avgcntr_albm values. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
a_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	Degrees of freedom planar fit a coefficient None	meters/degree	The a coefficient of the planar fit used to compute dot_dfwcntr_albm values. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
b_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Planar fit b coefficient None	meters/degree	The b coefficient of the planar fit used to compute dot_avgcntr_albm values. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
b_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	Degrees of freedom planar fit b coefficient None	meters/degree	The b coefficient of the planar fit used to compute dot_dfwcntr_albm values. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
c_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Planar fit c coefficient None	meters	The c coefficient of the planar fit used to compute dot_avgcntr_albm values. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
c_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	Degrees of freedom planar fit c coefficient None	meters	The c coefficient of the planar fit used to compute dot_dfwcntr_albm values. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
crs COMPACT	INTEGER_1(1)	Coordinate Reference System None	1	Coordinate Reference System (Source: Ocean ATBD)
crs_wkt	(Attribute)	GEOGCS["WGS 84",DATUM["WGS_1984",SPHEROID["WGS 84",6378137,298.257223563,AUTHORITY["EPSG","7030"]],AUTHORITY["EPSG","6326"]],PRIMEM["Greenwich",0,AUTHORITY["EPSG","8901"]],UNIT["degree",0.0174532925199433,AUTHORITY["EPSG","9122"]],AUTHORITY["EPSG","4326"]]		
grid_mapping_name	(Attribute)	latitude_longitude		
inverse_flattening	(Attribute)	298.257223563		
longitude_of_prime_meridian	(Attribute)	0.0		

proj4text	(Attribute)	+proj=longlat +datum=WGS84 +no_defs		
semi_major_axis	(Attribute)	6378137.0		
srid	(Attribute)	urn:ogc:def:crs:EPSG::4326		
delta_time_beg COMPACT	DOUBLE(1) INVALID_R8B	Beginning elapsed GPS seconds None	seconds	Beginning elapsed GPS seconds for the month of mid_latitude data (Source: Ocean ATBD)
delta_time_end COMPACT	DOUBLE(1) INVALID_R8B	Ending elapsed GPS seconds None	seconds	Ending elapsed GPS seconds for the month of mid_latitude data (Source: Ocean ATBD)
depth_avg_albm CHUNKED	FLOAT(:,:) INVALID_R4B	Mean ocean depth None	meters	All beam average of ocean segment ocean depth for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
depth_dfw_albm CHUNKED	FLOAT(:,:) INVALID_R4B	Degrees of freedom (DOF) weighted mean ocean depth None	meters	All beam degrees of freedom (DOF) weighted average of ocean segment ocean depth for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dof_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Total degrees of freedom None	counts	All beam total of ocean segment degrees of freedom (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT None	meters	All beam average of ATL12 ocean segments dynamic ocean topography (DOT) within each cell grid (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avg_uncrtn_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Uncertainty of mean DOT None	meters	All beam uncertainty of mean ocean segment DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs:		
dot_avgcntr CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT at cell center None	meters	Simple all-beam average of ATL12 ocean segments dynamic ocean topography interpolated to center of grid cell based on DOT values from the 3x3 cell box surrounding the center cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avgcntr_uncrtn CHUNKED	DOUBLE(:,:) INVALID_R8B	Uncertainty of mean DOT center None	meters	All beam uncertainty of ocean segment dynamic ocean topography (DOT) interpolated to center of grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT None	meters	All beam DOF-weighted average of ATL12 ocean segments DOT within each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfw_uncrtn_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Uncertainty of DOF-weighted DOT None	meters	All beam uncertainty of DOF-weighted average of ocean segment DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfwcntr CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF weighted mean DOT at cell center None	meters	Degree of freedom weighted all-beam average dynamic ocean topography interpolated to center of grid cell based on DOT data from the 3x3 cell box surrounding the center cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_hist_albm CHUNKED	FLOAT(:,:,:) INVALID_R4B	All beam aggregate PDF of photon heights None	1/meter	All beam aggregate probability density function of all surface photon DOT for all the ocean segments in the grid cell. The histogram bin center height values are provided in dimension scale /ds_hist_bincenters. The latitude and longitude of each grid cell are provided in/mid_latitude/gridcntr_lat and /mid_latitude/gridcntr_lon. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_sigma_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT sigma None	meters	All beam simple average of ocean segment standard deviation of dynamic ocean topography (DOT). (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_sigma_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT sigma None	meters	All beam DOF-weighted average of ocean segment standard deviation of DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
geoid_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean geoid height None	meters	All beam average of ocean segment mean tide system geoid height. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		

geoid_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean geoid height None	meters	All beam DOF-weighted average of ocean segment mean tide system geoid height. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
gridcntr_lat CHUNKED	DOUBLE(:,:)	Grid cell center latitude None	degrees_north	Defined center latitude for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
gridcntr_lon CHUNKED	DOUBLE(:,:)	Grid cell center longitude None	degrees_east	Defined center longitude for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ice_conc_albm CHUNKED	FLOAT(:,:)	Mean ice concentration None	1	All beam average of ice concentration. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
landmask CHUNKED	INTEGER(:,:)	Ocean landmask None	1	Ocean landmask. 0=land, 1=ocean. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lat_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean latitude None	degrees_north	All beam average of ocean segment latitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lat_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean latitudes None	degrees_north	All beam DOF-weighted average of ocean segment latitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
latitude CHUNKED	DOUBLE(:)	Grid cell center latitudes latitude	degrees_north	Grid cell center latitudes (dimension scale) (Source: Ocean ATBD)
axis	(Attribute)	Y		
length_dfw_albm CHUNKED	FLOAT(:,:) INVALID_R4B	DOF-weighted mean ocean segment length None	meters	All beam DOF-weighted average of ocean segment lengths. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
length_sum_albm CHUNKED	FLOAT(:,:) INVALID_R4B	Sum of ocean segment lengths None	meters	All beam sum of ocean segment lengths. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lon_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean longitude None	degrees_east	All beam average of ocean segment longitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lon_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean grid longitude None	degrees_east	All beam DOF-weighted average of ocean segment longitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
longitude CHUNKED	DOUBLE(:)	Grid cell center longitude longitude	degrees_east	Grid cell center longitudes (dimension scale) (Source: Ocean ATBD)
axis	(Attribute)	X		
n_ph_srfc_albm CHUNKED	INTEGER(:,:)	Number of surface photons None	counts	All beam sum of ocean segment number of surface reflected photons. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_phs_ttl_albm CHUNKED	INTEGER(:,:)	Number of total photons None	counts	All beam sum of ocean segment total number of photons. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_segs_albm CHUNKED	INTEGER(:,:)	Number of ocean segments None	counts	All beam number of ocean segments. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
podppd_flag_prcnt_albm CHUNKED	FLOAT(:,:) INVALID_R4B	Percent segments used with podppd_flag=0 None	1	All beam percent of ATL12 segments used that had podppd_flag_seg=0 for each grid cell. (Source: Ocean ATBD)

grid_mapping	(Attribute)	crs		
r_noise_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Rate of noise photons per meter None	1/meter	All beam rate of noise photons per meter. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
r_srfc_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Rate of surface photons per meter None	1/meter	All beam rate of surface photons per meter. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
sea_ice_flag CHUNKED	INTEGER(:,:) INVALID_I4B	Sea ice flag None	counts	TBD (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean sea state bias None	meters	All beam average of ocean segment sea state bias (SSB). (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_avgcntr CHUNKED	DOUBLE(:,:) INVALID_R8B	Sea state bias at cell center None	meters	All beam estimate of sea state bias (SSB) at center of each grid cell for dot_avgcntr. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean sea state bias None	meters	All beam DOF-weighted average of ocean segment sea state bias. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_dfwcntr CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted sea state bias at cell center None	meters	All beam estimate of sea state bias at center of grid cell for dot_dfwcntr. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
surf_prcnt_avg_albm CHUNKED	FLOAT(:,:,:) INVALID_R4B	Mean surface type None	1	All beam average of the percentage of each surface type. Map order: land, ocean, sea ice, ice sheet, inland water. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
surf_prcnt_dfw_albm CHUNKED	FLOAT(:,:,:) INVALID_R4B	DOF-weighted mean surface type None	1	All beam DOF-weighted average of the percentage of each surface type. Map order: land, ocean, sea ice, ice sheet, inland water. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
swh_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean significant waveheight None	meters	All beam mean of the ocean segment significant wave heights. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
swh_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean significant wave height None	meters	All beam DOF-weighted average of ocean segment significant wave height. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
Group: /mid_latitude/beam_x		This group contains data for beams 1, 3, and 5 (strong beams), and beams 2, 4, and 6 (weak beams).		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
depth_avg CHUNKED	FLOAT(:,:) INVALID_R4B	Mean ocean depth None	meters	Average of ocean segment ocean depth for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
depth_dfw CHUNKED	FLOAT(:,:) INVALID_R4B	Degrees of freedom (DOF) weighted mean ocean depth None	meters	Degrees of freedom (DOF) weighted average of ocean segment ocean depth. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dof CHUNKED	DOUBLE(:,:) INVALID_R8B	Total degrees of freedom None	meters	Beam total of ocean segment degrees of freedom (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT None	meters	Average of ATL12 ocean segments dynamic ocean topography (DOT) within each grid cell for one beam. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avg_uncrtn	DOUBLE(:,:)	Uncertainty of mean	meters	Uncertainty of mean ocean segment DOT

CHUNKED	INVALID_R8B	DOT None		(Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT None	meters	DOF-weighted average of ATL12 ocean segments DOT within each grid cell for one beam. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfw_uncrtn CHUNKED	DOUBLE(:,:) INVALID_R8B	Uncertainty of DOF-weighted DOT None	meters	Uncertainty of DOF-weighted average of ocean segment DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_kurt_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT kurtosis None	1	Average of ocean segment excess kurtosis of the dynamic ocean topography (DOT) (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_kurt_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT kurtosis None	1	Kurtosis of the dynamic ocean topography (DOT) as a degree-of-freedom weighted average of kurtosis of DOT of ocean segments (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_sigma_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT sigma None	meters	Simple average of ocean segment standard deviation of dynamic ocean topography (DOT) (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_sigma_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT sigma None	meters	DOF-weighted average of ocean segment standard deviation of DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_skew_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT skewness None	1	Average of ocean segment skewness of the dynamic ocean topography (DOT) (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_skew_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT skewness None	1	Skewness of the dynamic ocean topography (DOT) as a degree-of-freedom weighted average of skewness of DOT of ocean segments. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
geoid_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean geoid height None	meters	Average of ocean segment mean tide system geoid height (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
geoid_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean geoid height None	meters	DOF-weighted average of ocean segment mean tide system geoid height (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ice_conc CHUNKED	FLOAT(:,:)	Mean ice concentration None	1	Average of ice concentration. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lat_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean latitudes None	degrees_north	Average of ocean segment latitude (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lat_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean latitude None	degrees_north	DOF-weighted average of ocean segment latitude (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
length_dfw CHUNKED	FLOAT(:,:) INVALID_R4B	DOF weighted mean of ocean segment lengths None	meters	DOF-weighted average of ocean segment length. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
length_sum CHUNKED	FLOAT(:,:) INVALID_R4B	Sum of ocean segment lengths None	meters	Sum of ocean segment lengths for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lon_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean longitudes None	degrees_east	Average of ocean segment longitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lon_dfw	DOUBLE(:,:)	DOF-weighted mean	degrees_east	DOF-weighted average of ocean segment longitude.

CHUNKED	INVALID_R8B	longitude None		(Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_ph_srfc CHUNKED	INTEGER(:,:) 	Number of surface photons None	counts	Sum of ocean segment number of surface reflected photons (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_phs_ttl CHUNKED	INTEGER(:,:) 	Number of total photons None	counts	Sum of ocean segment total number of photons (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_segs CHUNKED	INTEGER(:,:) 	Number of ocean segments None	counts	Number of ocean segments (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
podppd_flag_prcnt CHUNKED	FLOAT(:,:) INVALID_R4B	Percent segments used with podppd_flag=0 None	1	Percent of ATL12 segments used that had podppd_flag_seg=0 for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
r_noise CHUNKED	DOUBLE(:,:) INVALID_R8B	Rate of noise photons per meter None	1/meter	Rate of noise photons per meter (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
r_srfc CHUNKED	DOUBLE(:,:) INVALID_R8B	Rate of surface photons per meter None	meters	Rate of surface photons per meter (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean sea state bias None	meters	Average of ocean segment sea state bias (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean sea state bias None	meters	DOF-weighted average of ocean segment sea state bias (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
surf_prcnt_avg CHUNKED	FLOAT(:,:,:) INVALID_R4B	Mean surface type None	1	Average of the percentage of each surface type. Map order: land, ocean, sea ice, ice sheet, inland water (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
surf_prcnt_dfw CHUNKED	FLOAT(:,:,:) INVALID_R4B	DOF-weighted mean surface type None	1	DOF-weighted average of the percentage of each surface type. Map order: land, ocean, sea ice, ice sheet, inland water (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
swh_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean significant wave height None	meters	Mean of the ocean segment significant wave height (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
swh_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean significant wave heights None	meters	DOF-weighted average of ocean segment significant wave height (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
Group: /orbit_info		Contains orbit information.		
data_rate	(Attribute)	Varies. Data are only provided when one of the stored values (besides time) changes.		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
crossing_time CHUNKED	DOUBLE(:) 	Ascending Node Crossing Time time	seconds since 2018-01-01	The time, in seconds since the ATLAS SDP GPS Epoch, at which the ascending node crosses the equator. The ATLAS Standard Data Products (SDP) epoch offset is defined within /ancillary_data/atlas_sdp_gps_epoch as the number of GPS seconds between the GPS epoch (1980-01-06T00:00:00.000000Z UTC) and the ATLAS SDP epoch. By adding the offset contained within atlas_sdp_gps_epoch to delta time parameters, the time in gps_seconds relative to the GPS epoch can be computed. (Source: POD/PPD)
cycle_number CHUNKED	INTEGER_1(:) 	Cycle Number None	1	A count of the number of exact repeats of this reference orbit. (Source: Operations)
lan CHUNKED	DOUBLE(:) 	Ascending Node Longitude None	degrees_east	Longitude at the ascending node crossing. (Source: POD/PPD)

orbit_number CHUNKED	UINT_2_LE(:)	Orbit Number None	1	Unique identifying number for each planned ICESat-2 orbit. (Source: Operations)
rgt CHUNKED	INTEGER_2(:)	Reference Ground track None	1	The reference ground track (RGT) is the track on the earth at which a specified unit vector within the observatory is pointed. Under nominal operating conditions, there will be no data collected along the RGT, as the RGT is spanned by GT3 and GT4. During slews or off-pointing, it is possible that ground tracks may intersect the RGT. The ICESat-2 mission has 1387 RGTs. (Source: POD/PPD)
sc_orient CHUNKED	INTEGER_1(:)	Spacecraft Orientation None	1	This parameter tracks the spacecraft orientation between forward, backward and transitional flight modes. ICESat-2 is considered to be flying forward when the weak beams are leading the strong beams; and backward when the strong beams are leading the weak beams. ICESat-2 is considered to be in transition while it is maneuvering between the two orientations. Science quality is potentially degraded while in transition mode. (Source: POD/PPD); (Meanings: [0 1 2]) (Values: ['backward', 'forward', 'transition'])
sc_orient_time CHUNKED	DOUBLE(:)	Time of Last Spacecraft Orientation Change time	seconds since 2018-01-01	The time of the last spacecraft orientation change between forward, backward and transitional flight modes, expressed in seconds since the ATLAS SDP GPS Epoch. ICESat-2 is considered to be flying forward when the weak beams are leading the strong beams; and backward when the strong beams are leading the weak beams. ICESat-2 is considered to be in transition while it is maneuvering between the two orientations. Science quality is potentially degraded while in transition mode. The ATLAS Standard Data Products (SDP) epoch offset is defined within /ancillary_data/atlas_sdp_gps_epoch as the number of GPS seconds between the GPS epoch (1980-01-06T00:00:00.000000Z UTC) and the ATLAS SDP epoch. By adding the offset contained within atlas_sdp_gps_epoch to delta time parameters, the time in gps_seconds relative to the GPS epoch can be computed. (Source: POD/PPD)
Group: /quality_assessment		Contains quality assessment data. This may include QA counters, QA along-track data and/or QA summary data.		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
qa_granule_fail_reason COMPACT	INTEGER(1)	Granule Failure Reason None	1	Flag indicating granule failure reason. 0=no failure; 1=processing error; 2=Insufficient output data was generated; 3=TBD Failure; 4=TBD_Failure; 5=other failure. (Source: Operations); (Meanings: [0 1 2 3 4 5]) (Values: ['no_failure', 'PROCESS_ERROR', 'INSUFFICIENT_OUTPUT', 'failure_3', 'failure_4', 'OTHER_FAILURE'])
qa_granule_pass_fail COMPACT	INTEGER(1)	Granule Pass Flag None	1	Flag indicating granule quality. 0=granule passes automatic QA. 1=granule fails automatic QA. (Source: Operations); (Meanings: [0 1]) (Values: ['PASS', 'FAIL'])
Group: /x_polar		This group contains the polar grids, and will be instantiated as north_polar and south_polar.		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
a_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Planar fit a coefficient None	meters/meter	The a coefficient of the planar fit used to compute dot_avgcntr_albm. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
a_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	Degrees of freedom planar fit a coefficient None	meters/meter	The a coefficient of the planar fit used to compute dot_dfwcntr_albm. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
b_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Planar fit b coefficient None	meters/meter	The b coefficient of the planar fit used to compute dot_avgcntr_albm. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
b_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	Degrees of freedom planar fit b coefficient None	meters/meter	The b coefficient of the planar fit used to compute dot_dfwcntr_albm. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
c_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Planar fit c coefficient None	meters	The c coefficient of the planar fit used to compute dot_avgcntr_albm. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
c_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	Degrees of freedom planar fit c coefficient None	meters	The c coefficient of the planar fit used to compute dot_dfwcntr_albm. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
crs COMPACT	INTEGER_1(1)	NSIDC Sea Ice Polar Stereographic CRS None	NOT_SET	Coordinate reference system identification for NSIDC Sea Ice Polar Stereographic (Hughes ellipsoid) (Source: NetCDF)
crs_wkt	(Attribute)	SET_BY_PGE		
false_easting	(Attribute)	0.0		
false_northing	(Attribute)	0.0		
grid_mapping_name	(Attribute)	polar_stereographic		
inverse_flattening	(Attribute)	298.279411123061		
latitude_of_projection_origin	(Attribute)	0.0		
longitude_of_projection_origin	(Attribute)	0.0		
proj4text	(Attribute)	SET_BY_PGE		
semi_major_axis	(Attribute)	6378273.0		
srid	(Attribute)	SET_BY_PGE		
standard_parallel	(Attribute)	SET_BY_PGE		
delta_time_beg	DOUBLE(1)	Beginning elapsed GPS	seconds	Beginning elapsed GPS seconds for the month of data

COMPACT	INVALID_R8B	seconds None		(Source: Ocean ATBD)
delta_time_end COMPACT	DOUBLE(1) INVALID_R8B	Ending elapsed GPS seconds None	seconds	Ending elapsed GPS seconds for the month of data (Source: Ocean ATBD)
depth_avg_albm CHUNKED	FLOAT(:,:) INVALID_R4B	Mean ocean depth None	meters	All beam average of ocean segment ocean depth. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
depth_dfw_albm CHUNKED	FLOAT(:,:) INVALID_R4B	Degrees of freedom (DOF) weighted mean depth None	meters	All beam degrees of freedom (DOF) weighted average of ocean segment ocean depth. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dof_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Total degrees of freedom None	counts	All beam total of degrees of ocean segment freedom in the grid cell (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT None	meters	All beam average of ATL12 ocean segments dynamic ocean topography (DOT) within each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avg_uncrtn_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Uncertainty of mean DOT None	meters	All beam uncertainty of mean ocean segment DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avgcntr CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT at cell center None	meters	Simple all-beam average of ATL12 ocean segments dynamic ocean topography interpolated to center of grid cell based on DOT values from the 3x3 cell box surrounding the center cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avgcntr_uncrtn CHUNKED	DOUBLE(:,:) INVALID_R8B	Uncertainty of mean DOT center None	meters	All beam uncertainty of ocean segment dynamic ocean topography (DOT) interpolated to center of grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT None	meters	All beam DOF-weighted all beam average of ATL12 ocean segments DOT within each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfw_uncrtn_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Uncertaintity of DOF-weighted DOT None	meters	All beam uncertainty of DOF-weighted average of ocean segment DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfwcntr CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT at cell center None	meters	Degree of freedom weighted all-beam average dynamic ocean topography interpolated to center of grid cell based on DOT data from the 3x3 cell box surrounding the center cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_hist_albm CHUNKED	FLOAT(:,:,:) INVALID_R4B	Aggregate PDF of photon heights None	1/meter	All beam aggregate probability density function of all surface photon DOT for all the ocean segments in the grid cell. The histogram bin center height values are provided in dimension scale /ds_hist_bincenters. The x and y are provided in dimension scale /north or south_polar/ds_grid_x and ds_grid_y. The latitude and longitude of each grid cell are provided in/north or south _polar/gridcntr_lat and /north or south _polar/gridcntr_lon. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_sigma_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT sigma None	meters	All beam simple average of ocean segment standard deviation of dynamic ocean topography (DOT). (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_sigma_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT sigma None	meters	All beam DOF-weighted average of ocean segment standard deviation of DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ds_grid_x CHUNKED	DOUBLE(:)	Gridded X dimension scale projection_x_coordinate	meters	Center of grid cell X values (Source: Ocean ATBD)
axis	(Attribute)	X		
ds_grid_y CHUNKED	DOUBLE(:)	Gridded Y dimension scale projection_y_coordinate	meters	Center of grid cell Y values (Source: Ocean ATBD)

axis	(Attribute)	Y		
geoid_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean geoid height None	meters	All beam average of ocean segment mean tide system geoid height. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
geoid_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF weighted mean geoid height None	meters	All beam DOF-weighted average of ocean segment mean tide system geoid height. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
gridcntr_lat CHUNKED	DOUBLE(:,:) INVALID_R8B	Grid cell center latitude None	degrees_north	Defined center latitude for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
gridcntr_lon CHUNKED	DOUBLE(:,:) INVALID_R8B	Grid cell center longitude None	degrees_east	Defined center longitude for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ice_conc_albm CHUNKED	FLOAT(:,:)	Mean ice concentration None	1	All beam average of ice concentration. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
landmask CHUNKED	INTEGER(:,:)	Ocean landmask None	1	Ocean landmask. 0=land, 1=ocean. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lat_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean latitude None	degrees_north	All beam average of ocean segment latitudes. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lat_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF weighted mean latitude None	degrees_north	All beam DOF-weighted average of ocean segment latitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
length_dfw_albm CHUNKED	FLOAT(:,:) INVALID_R4B	DOF-weighted mean ocean segment length None	meters	All beam DOF-weighted average of ocean segment lengths. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
length_sum_albm CHUNKED	FLOAT(:,:) INVALID_R4B	Sum of ocean segment lengths None	meters	All beam sum of ocean segment lengths. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lon_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean longitude None	degrees_east	All beam average of ocean segment longitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lon_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF weighted mean longitude None	degrees_east	All beam DOF-weighted average of ocean segment longitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_ph_srfc_albm CHUNKED	INTEGER(:,:)	Number of surface photons None	counts	All beam sum of ocean segment number of surface reflected photons. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_phs_ttl_albm CHUNKED	INTEGER(:,:)	Number of total photons None	counts	All beam sum of ocean segment total number of photons. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_segs_albm CHUNKED	INTEGER(:,:)	Number of ocean segments None	counts	All beam number of ocean segments for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
podppd_flag_prcnt_albm CHUNKED	FLOAT(:,:) INVALID_R4B	Percent segments used with podppd_flag=0 None	1	All beam percent of ATL12 segments used that had podppd_flag_seg=0 for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
r_noise_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Rate of noise photons per meter	1/meter	All beam rate of noise photons per meter (Source: Ocean ATBD)

		None		
grid_mapping	(Attribute)	crs		
r_srfc_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Rate of surface photons per meter None	meters	All beam rate of surface photons per meter (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
sea_ice_flag CHUNKED	INTEGER(:,:) INVALID_I4B	Sea ice flag None	counts	TBD (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean sea state bias None	meters	All beam simple average of ocean segment sea state bias. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_avgcntr CHUNKED	DOUBLE(:,:) INVALID_R8B	Sea state bias at cell center None	meters	All beam estimate of sea state bias at center of each grid cell for dot_avgcntr. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean sea state bias None	meters	All beam DOF-weighted average of ocean segment sea state bias (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_dfwcntr CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted sea state bias at cell center None	meters	All beam estimate of sea state bias at center of grid cell for dot_dfwcntr. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
surf_prcnt_avg_albm CHUNKED	FLOAT(:,:,:) INVALID_R4B	Mean surface type None	1	All beam average of the percentage of each surface type. Map order: land, ocean, sea ice, ice sheet, inland water. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
surf_prcnt_dfw_albm CHUNKED	FLOAT(:,:,:) INVALID_R4B	DOF-weighted mean surface type None	1	All beam DOF-weighted average of the percentage of each surface type. Map order: land, ocean, sea ice, ice sheet, inland water. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
swh_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean significant wave height None	meters	All beam average of the ocean segment significant wave height. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
swh_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean significant wave height None	meters	All beam DOF-weighted average of ocean segment significant wave height. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
x_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean x None	meters	All beam average of ocean segment x (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
x_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean x None	meters	All beam DOF-weighted average of ocean segment x (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
y_avg_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean y None	meters	All beam average of ocean segment y (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
y_dfw_albm CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean y None	meters	All beam DOF-weighted average of ocean segment y (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
Group: /x_polar/beam_x		This group contains data for beams 1, 3, and 5 (strong beams), and beams 2, 4, and 6 (weak beams).		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
depth_avg CHUNKED	FLOAT(:,:) INVALID_R4B	Mean ocean depth None	meters	Average of ocean segment ocean depth. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
depth_dfw CHUNKED	FLOAT(:,:) INVALID_R4B	Degrees of freedom (DOF) weighted mean ocean depth None	meters	Degrees of freedom (DOF) weighted average of ocean segment ocean depth. (Source: Ocean ATBD)

grid_mapping	(Attribute)	crs		
dof CHUNKED	DOUBLE(:,:) INVALID_R8B	Total DOF None	counts	Beam total of ocean segment degrees of freedom (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT None	meters	Average of ATL12 ocean segments dynamic ocean topography (DOT) within each grid cell for one beam. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_avg_uncrtn CHUNKED	DOUBLE(:,:) INVALID_R8B	Uncertainty of mean DOT None	meters	Uncertainty of mean ocean segment DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT None	meters	DOF-weighted average of ATL12 ocean segments DOT within each grid cell for one beam. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_dfw_uncrtn CHUNKED	DOUBLE(:,:) INVALID_R8B	Uncertainty of DOF-weighted DOT None	meters	Uncertainty of DOF-weighted average of ocean segment DOT (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_kurt_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT kurtosis None	1	Average of ocean segment excess kurtosis of the dynamic ocean topography (DOT) for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_kurt_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT kurtosis None	1	Kurtosis of the dynamic ocean topography (DOT) as a degree-of-freedom weighted average of kurtosis of DOT of ocean segments in each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_sigma_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT sigma None	meters	Average of ocean segment standard deviation of dynamic ocean topography (DOT). (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_sigma_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT sigma None	meters	DOF-weighted average of ocean segment standard deviation of DOT. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_skew_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean DOT skewness None	1	Average of ocean segment skewness of the dynamic ocean topography (DOT) for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
dot_skew_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean DOT skewness None	1	Skewness of the dynamic ocean topography (DOT) as a degree-of-freedom weighted average of skewness of DOT of ocean segments in each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
geoid_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean geoid height None	meters	Average of ocean segment mean tide system geoid height for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
geoid_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean geoid height None	meters	DOF-weighted average of ocean segment mean tide system geoid height. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ice_conc CHUNKED	FLOAT(:,:)	Mean ice concentration None	1	Average of ice concentration. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lat_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean latitude None	degrees_north	Average of ocean segment latitude (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lat_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean latitude None	degrees_north	DOF-weighted average of ocean segment latitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
length_dfw CHUNKED	FLOAT(:,:) INVALID_R4B	DOF-weighted mean ocean segment lengths None	meters	DOF-weighted average of ocean segment length. (Source: Ocean ATBD)

grid_mapping	(Attribute)	crs		
length_sum CHUNKED	FLOAT(:,:) INVALID_R4B	Sum of ocean segment lengths None	meters	Sum of ocean segment lengths for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lon_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean longitude None	degrees_east	Average of ocean segment longitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
lon_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean longitude None	degrees_east	DOF-weighted average of ocean segment longitude. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_ph_srfc CHUNKED	INTEGER(:,:)	Number of surface photons None	counts	Sum of ocean segment number of surface reflected photons. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_phs_ttl CHUNKED	INTEGER(:,:)	Number of total photons None	counts	Sum of ocean segment total number of photons. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
n_segs CHUNKED	INTEGER(:,:)	Number of ocean segments None	counts	Number of ocean segments for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
podppd_flag_prcnt CHUNKED	FLOAT(:,:) INVALID_R4B	Percent segments used with podppd_flag=0 None	1	Percent of ATL12 segments used that had podppd_flag_seg=0 for each grid cell. (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
r_noise CHUNKED	DOUBLE(:,:) INVALID_R8B	Rate of noise photons per meter None	1/meter	Rate of noise photons per meter (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
r_srfc CHUNKED	DOUBLE(:,:) INVALID_R8B	Rate of surface photons per meter None	meters	Rate of surface photons per meter (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean sea state bias None	meters	Average of ocean segment sea state bias (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
ssb_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean sea state bias None	meters	DOF-weighted average of ocean segment sea state bias (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
surf_prcnt_avg CHUNKED	FLOAT(:,:,:) INVALID_R4B	Mean surface type None	1	Simple averages of the percentages of each surface type for each grid cell. Map order: land, ocean, sea ice, ice sheet, inland water (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
surf_prcnt_dfw CHUNKED	FLOAT(:,:,:) INVALID_R4B	DOF Weighted surface type average None	1	DOF-weighted average of the percentages of each surface type for each grid cell. Map order: land, ocean, sea ice, ice sheet, inland water (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
swh_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean significant wave height None	meters	Mean of the ocean segment significant wave height (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
swh_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF-weighted mean significant waveheights None	meters	DOF-weighted average of ocean segment significant wave height (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
x_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean x None	meters	Average of ocean segment x (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		

x_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF wt'd mean x None	meters	Degrees of freedom (DOF) weighted average of ocean segment x (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
y_avg CHUNKED	DOUBLE(:,:) INVALID_R8B	Mean y None	meters	Average of ocean segment y (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		
y_dfw CHUNKED	DOUBLE(:,:) INVALID_R8B	DOF wt'd mean y None	meters	Degrees of freedom (DOF) weighted average of ocean segment y (Source: Ocean ATBD)
grid_mapping	(Attribute)	crs		