ATL13 Product Data Dictionary

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description	(Attribute)	This data set (ATL13) contains along track surface heights of inland water bodies, including lakes, estuaries and rivers. Water surface slope and descriptive statistics are also provided. The data were acquired by the Advanced Topographic Laser Altimeter S
level	(Attribute)	L3A
short_name	(Attribute)	ATL13
title	(Attribute)	SET_BY_META
Group: /		This data set (ATL13) contains along track surface heights of inland water bodies, including lakes, estuaries and rivers. Water surface slope and descriptive statistics are also provided. The data were acquired by the Advanced Topographic Laser Altimeter S
Conventions	(Attribute)	CF-1.6
citation	(Attribute)	SET_BY_META
contributor_name	(Attribute)	Thomas E 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
featureType	(Attribute)	trajectory
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)	ATL13
hdfversion	(Attribute)	SET_BY_PGE
history	(Attribute)	SET_BY_PGE
identifier_file_uuid	(Attribute)	SET_BY_PGE
identifier_product_doi	(Attribute)	10.5067/ATLAS/ATL13.001
identifier_product_doi_authority	(Attribute)	http://dx.doi.org
identifier_product_format_version	(Attribute)	SET_BY_PGE
identifier_product_type	(Attribute)	ATL13
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)	L3A		
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
ds_anom_trigger COMPACT	INTEGER([8])	Anomaly Trigger Dimension Scale None	1	Dimension scale indexing the short segment anomaly trigger array having eight elements. Index = 1 corresponds to coarse ht difference; Index = 2 corresponds to abnormal length; Index = 3 corresponds to histogram mode spread; Index = 4 corresponds to histogram mode count; Index = 5 corresponds to histogram mode intensity; Index = 6 corresponds to invalid long segment; Index = 7 corresponds to shore buffer designation; Index = 8 corresponds to insufficient signal phs (Source: dim_scale); (Meanings: [1 2 3 4 5 6 7 8]) (Values: ['coarse_ht_difference' 'abnormal_length' 'histogram_mode_spread' 'histogram_mode_count' 'histogram_mode_intensity' 'invalid_long_segment' 'shore_buffer_designation' 'insufficient_signal_phs'])
ds_sseg_quality COMPACT	INTEGER([4])	Segment Quality Dimension Scale None	1	Dimension scale indexing the short segment quality array. Index = 1 corresponds to nominal; Index = 2 corresponds to possible afterpulse; Index = 3 corresponds to possible impulse response; Index = 4 corresponds to possible TEP (Source: dim_scale); (Meanings: [1 2 3 4]) (Values: ['nominal' 'possible_afterpulse' 'possible_impulse_response' 'possible_TEP'])
Group: /ancillary_data		Contains information ancillary to the data product. This may include product characteristics, instrument characteristics and/or processing constants.		
data_rate	(Attribute)	Data within this group pertain to the granule in its entirety.		
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 COMPACT	STRING([1])	Start UTC Time of Granule (CCSDS-A, Requested) None	1	Requested start time (in UTC CCSDS-A) of this granule. (Source: Derived)
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	DOUBLE([1])	Start GPS SOW	seconds	GPS seconds-of-week of the first data point in the

COMPACT		of Granule (Actual) None		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/inland_water		Contains general ancillary parameters.		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
anmly_test COMPACT	FLOAT([4])	Anomaly Test None	meters	Array containing threshold values against which to test segments for anomalous changes in height. The mode of each segment histogram will be tested against ht_water_coarse and excluded if the difference is greater than the value associated with the segment (Source: ATBD Table 5-2)
atm_window1 COMPACT	FLOAT([1])	ATM Background Window Bottom None	meters	Lower limit of height above coarse water surface height for atmospheric background count calculation. (Source: ATBD Table 5-2)
atm_window2 COMPACT	FLOAT([1])	ATM Background Window Top None	meters	Upper limit of height above coarse water surface height for atmospheric background count calculation. (Source: ATBD Table 5-2)
b1_sseg1 COMPACT	FLOAT([1])	Small Segment Bin Size None	meters	Bin size to be used for histogramming of each small segment. (Source: ATBD Table 5-2)
b2_sseg1 COMPACT	FLOAT([1])	Small Segment Height Bin Size None	meters	Bin size to be used for histogramming of small segment heights. (Source: ATBD Table 5-2)
b_long COMPACT	FLOAT([1])	Long Bin Size None	meters	Bin size to be used by which to establish a histogram of long segments.

				(Source: ATBD Table 5-2)
bckgrd_threshold COMPACT	FLOAT([2])	Background Threshold None	counts/sec	Thresholds outside of which computed background is flagged (High, Low). (Source: ATBD Table 5-2)
bin_detrend COMPACT	FLOAT([1])	Detrend Bin Size None	meters	Bin size used to establish a band of heights over which to determine the detrending equation. (Source: ATBD Table 5-2)
c_adj COMPACT	FLOAT([1])	C Adjustment None	1	Adjustment for the speed of light through water (cl) (Source: ATBD Table 5-2)
c_fresnel COMPACT	FLOAT([1])	Fresnel Coeff None	1	Fresnel specular reflection coefficient @ 532 nm (Source: ATBD Table 5-2)
detrend_width COMPACT	FLOAT([1])	Detrend Width None	1	Number of standard deviations +/- mode to include in detrend band. (Source: ATBD Table 5-2)
f2_d_min COMPACT	FLOAT([1])	Minimum Distance Thres None	meters	Minimum distance threshold between photons required for inclusion in algorithm. (Source: ATBD Table 5-2)
gauss_pk_thres COMPACT	FLOAT([1])	Gaussian Peak Threshold None	1	Fraction of the peak amplitude above which Gaussian fit error analysis is executed (ie, calculate error on Gaussian only between the peak amplitude and gauss_pk_thres * peak) (Source: ATBD Table 5-2)
geoseg_edge_buffer COMPACT	INTEGER_1([9, 9]) INVALID_I1B	geosegment edge buffer None	1	Number of geosegments to include in the water surface calculation that are outside of both water body edges, as identified by reference photon location comparison to water body shapes. (Source: ATL13 ATBD, Section 5.2, Table 5-2); (Meanings: [0 1 2 3 4 5]) (Values: ['buffer_0' 'buffer_1' 'buffer_2' 'buffer_3' 'buffer_4' 'buffer_5'])
h_mavg_a COMPACT	INTEGER([1])	Num Depth Bins A None	meters	Number of depth bins over which to compute H_mavg_a (Source: ATBD Table 5-2)
h_mavg_b COMPACT	INTEGER([1])	Num Depth Bins B None	meters	Number of depth bins over which to compute H_mavg_b (Source: ATBD Table 5-2)
h_mavg_c COMPACT	INTEGER([1])	Num Depth Bins C None	meters	Number of bins over which to calculate moving average (Source: ATBD Table 5-2)
l_sub COMPACT	INTEGER([1])	Long Subsurface Segment Size None	1	Long segment size, operationally used as unit length over which to characterize the subsurface, and deconvolve the instrument pulse and subsurface effects from the water surface response. (Source: ATBD Table 5-2)
l_surf COMPACT	INTEGER([1])	Long Surface Segment Size None	1	Long segment size, operationally used as unit length over which to detrend the water surface, characterize the surface, and deconvolve the instrument pulse and subsurface effects from the water surface response. (Source: ATBD Table 5-2)
lsbr_threshold COMPACT	FLOAT([1])	LSBR Threshold None	1	Threshold at which the LSBR indicates a significant transition from signal photon richness to noise. (Source: ATBD Table 5-2)
m_avg_d COMPACT	INTEGER([1])	Num Depth Bins D None	meters	Number of depth bins over which to compute P_ht_long_subsurf_mavg (Source: ATBD Table 5-2)
max_gseg_search COMPACT	INTEGER([1])	Max Geoseg Search Radius	1	Maximum number of geosegments in either direction to search for reported water surface

		None		heights (Source: ATBD Table 5-2)
ref_dist_iw_bdy COMPACT	FLOAT([1])	Reference Difference None	meters	Maximum distance from a water body that a geosegment reference photon indicates the need for overlap testing each individual photon in the geosegment (Source: ATBD Table 5-2)
s_seg1 COMPACT	INTEGER([1])	Short Segment Length None	1	Short segment size, operationally used as unit length over which to identify water surface height anomalies such as islands, bridges, etc. (Source: ATBD Table 5-2)
shore_buff_sseg_length COMPACT	INTEGER([1])	Shore buffer short segment length None	1	Maximum length of a short segment that can be marked as anomalous due to shore buffering. (Source: ATL13 ATBD, Section 5.2, Table 5-2)
shore_buffer COMPACT	INTEGER_1([9, 9]) INVALID_I1B	Shore buffer None	1	Number of near-shore short segments to ignore in analysis due to near-shore influences. (Source: ATL13 ATBD, Section 5.2, Table 5-2); (Meanings: [0 1]) (Values: ['buffer_0' 'buffer_1'])
sig_threshold COMPACT	INTEGER([1])	Signal Confidence Threshold None	1	Minimum signal confidence required for photon to be included in analysis (Source: ATBD Table 5-2)
signal_window_bottom COMPACT	FLOAT([1])	Signal Window Bottom None	meters	Lower limit below coarse water surface to include photons for analysis. (Source: ATBD Table 5-2)
signal_window_top COMPACT	FLOAT([1])	Signal Window Top None	meters	Upper limit above coarse water surface to include photons for analysis. (Source: ATBD Table 5-2)
size_to_process COMPACT	INTEGER_1([9, 9]) INVALID_I1B	Size to Process None	1	Water body sizes that are to be processed by the ATL13 algorithm for each water body type. This parameter is a rank 2 array of size 9x9, where array subscripts 1 through 9, coincide with body type digits along columns, and body size digits along rows. Array elements are binary values, if 0 then process body size for that type, 1 otherwise. Water body sizes are described in ATL13 chapter 4.7.1.2 and in Table 5-4. (Source: ATL13 ATBD, Section 4.7.1.2, Table 5-4); (Meanings: [0 1]) (Values: ['process_size' 'otherwise'])
sseg_length_test COMPACT	FLOAT([1])	Short Segment Length Test None	meters	Threshold by which to test the length of a short segment to determine if it is anomalous or not anomalous. (Source: ATBD Table 5-2)
sseg_mode_cnt_test CHUNKED	INTEGER_1([6]) INVALID_I1B	Short segment mode count test None	1	Threshold to test number of values contained in short segment histogram multimodes against for inclusion or exclusion of short segment (Source: ATBD Table 5-2); (Meanings: [10 10 7 7 7 7]) (Values: ['sseg_stdev_thres_1' 'sseg_stdev_thres_2' 'sseg_stdev_thres_3' 'sseg_stdev_thres_4' 'sseg_stdev_thres_5' 'sseg_stdev_thres_6'])
sseg_mode_freq_test COMPACT	INTEGER([1])	Short Segment Mode Frequency Test None	1	Threshold to test number of short segment histogram modes against for inclusion or exclusion of short segment. (Source: ATBD Table 5-2)
sseg_mode_spread_test COMPACT	FLOAT([1])	Short Segment Mode Spread Test None	meters	Threshold to test distance between short segment histogram multimodes against for inclusion or exclusion of short segment. (Source: ATBD Table 5-2)

sub_max COMPACT	FLOAT([1]) 	Subsurf Max Vertical Profile None	meters	Maximum vertical profile of water subsurface to include in estimation of subsurface characteristics (Source: ATBD Table 5-2)
type_to_process COMPACT	INTEGER_1([9]) INVALID_I1B	Type to Process None	1	Water body types that are to be processed by the ATL13 algorithm. This parameter is a rank 1 array of extent 9, with the body type digits coinciding with the array subscripts 1 through 9. Array elements are binary values, if 0 then process body type, 1 otherwise. Water body types are described in ATL13 chapter 4.7.1.2 and in Table 5-4. (Source: ATL13 ATBD, Section 4.7.1.2, Table 5-4); (Meanings: [0 1]) (Values: ['process_type' 'otherwise'])
Group: /gtx		Contains per-beam data products.		
data_rate	(Attribute)	Data within this group are stored at the inland water short segment rate (/ancillary_data/inland_water/s_seg2).		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
atl13refid CHUNKED	INTEGER_8(['Unlimited']) 0	ATL13 Reference ID None	1	Unique aggregate reference number for each shape in the ATL13 Inland Water Body Mask, where digit 1 = type, digit 2 = size, digit 3 = source, and digits 4-10 = shape id (Source: ATL13 ATBD, Section 5.3.1 (C))
cloud_flag_asr_atl09 CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Cloud Flag ASR None	1	Cloud probability from ASR. (Source: ATL13 ATBD, Section 5.3.5 (A)); (Meanings: [0 1 2 3 4 5]) (Values: ['clear_with_high_confidence' 'clear_with_medium_confidence' 'clear_with_low_confidence' 'cloudy_with_low_confidence' 'cloudy_with_medium_confidence' 'cloudy_with_high_confidence'])
cloud_flag_atm_atl09 CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Cloud Flag Atm None	1	Cloud flag from backscatter profile. (Source: ATL13 ATBD, Section 5.3.5 (A))
cycle CHUNKED	INTEGER_1(['Unlimited'])	Cycle Number None	counts	Tracks the number of 91-day cycles in the mission, beginning with 01. (Source: ATL03)
delta_time CHUNKED	DOUBLE(['Unlimited'])	Delta Time time	seconds since 2018-01-01	Number of GPS seconds since the ATLAS SDP epoch. 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: ATL03)
err_ht_water_surf CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Height Error None	1	Error included in heights reported in ht_water_surf. (Source: section 5.3.3 (C))
err_slope_trk CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Slope Error None	1	Error included in segment_slope_trk_local. (Source: section 5.3.3 (C))
ht_ortho CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Orthometric Height None	meters	Orthometric height EGM2008 converted from ellipsoidal height. (Source: ATL13 ATBD, Section 5.3.5 (A))
ht_water_surf CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Water surface height None	meters	Water surface height, reported for each short segment (default length = approximately 100 signal photons) with reference to WGS84 ellipsoid (Source: ATL13 ATBD, Section 5.3.5 (A))
ice_flag	INTEGER_1(['Unlimited'])	Ice Flag	1	Describes likelihood of ice on water surface short

CHUNKED	INVALID_I1B	None		segment. (Source: ATL13 ATBD, section 5.2); (Meanings: [0 1]) (Values: ['no_ice' 'ice'])
inland_water_body_id CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Body ID None	1	Identifying signature of an individual inland water body. Each body of water is represented by a unique numeric value. (Source: ATL13 ATBD, Section 5.3.1 (C))
inland_water_body_region CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Body region None	1	ATL13-created shapefile representing relevant bodies of water over which to implement the ATL13 water surface finding algorithm only within a region of processing interest. (Source: ATL13 ATBD, Section 5.3.1 (A))
inland_water_body_size CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Body size None	1	Size of Inland Water Body, A=area, where 0=Not_Assigned, 1=A>10,000 sq km, 2=10,000>A>=1,000, 3=1,000>A>=100, 4=100>A>=10, 5=10>A>=1, 6=1>A>=0.1, 7=0.01>A, 8=Reserved, 9=Reserved (Source: ATL13 ATBD, Section 5.3.1 (C)); (Meanings: [0 1 2 3 4 5 6 7 8 9]) (Values: ['not_assigned' 'area_gt_10000' '10000_gt_area_ge_1000' '1000_gt_area_ge_100' '100_gt_area_ge_10' '10_gt_area_ge_1' '1_gt_area_ge_0.1' '0.01_gt_area' 'Reserved' 'Reserved'])
inland_water_body_source CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Body source None	1	Source of Inland Water Body shape, where 1=HydroLAKES, 2=Global Lakes and Wetlands Database, 3=Named Marine Water Bodies, 4=GSHHG Shoreline, 5=Global River Widths from Landsat, 6=Reserved, 7=Reserved, 8=Reserved, 9=Reserved (Source: ATL13 ATBD, Section 5.3.1 (C)); (Meanings: [1 2 3 4 5 6 7 8 9]) (Values: ['HydroLAKES' 'Global_Lakes_and_Wetlands_Database' 'Named_Marine_Water_Bodies' 'GSHHG_Shoreline' 'Global_River_Widths_from_Landsat' 'Reserved' 'Reserved' 'Reserved' 'Reserved'])
inland_water_body_type CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Body type None	1	Type of Inland Water Body, where 1=Lake, 2=Known Reservoir, 3=(Reserved for future use), 4=Ephemeral Water, 5=River, 6=Estuary or Bay, 7=Coastal Water, 8=Reserved, 9=Reserved (Source: ATL13 ATBD, Section 5.3.1 (C)); (Meanings: [1 2 3 4 5 6 7 8 9]) (Values: ['Lake' 'Known_Reservoir' 'Reserved_for_future_use' 'Ephemeral_Water' 'River' 'Estuary_or_Bay' 'Coastal_Water' 'Reserved' 'Reserved'])
layer_flag_atl09 CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Consolidated cloud flag None	1	Consolidated cloud flag. (Source: ATL13 ATBD, Section 5.3.5 (A)); (Meanings: [0 1]) (Values: ['likely_clear' 'likely_cloudy'])
met_ts_atl09 CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Surface temperature temperature	K	Surface (skin) temperature from ATL09. (Source: ATL13 ATBD, Section 5.3.5 (A))
met_wind10_atl09 CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Wind speed magnitude at 10m Wind speed	m/s	Wind speed magnitude at 10m height from ATL09 input. (Source: ATL13 ATBD, Section 5.3.5 (A))
met_wind10_atl13 CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Wind speed magnitude at 10m Wind speed	m/s	Wind speed magnitude at 10m height, based on derived water surface wave height. (Source: ATL13 ATBD, Section 5.3.5 (A))
qf_bckgrd	INTEGER(['Unlimited'])	Background	1	Describes the degree of background photons

CHUNKED	INVALID_I4B	Quality Flag None		present in each short segment. bckgrd_dnsty_threshold1= 0.001 (counts per bi per Lseg); bckgrd_dnsty_threshold2= 0.01 (counts per bin per Lseg); bckgrd_dnsty_threshold3= 0.05 (counts per bin per Lseg); bckgrd_dnsty_threshold4= 0.1 (counts per bin per Lseg); bckgrd_dnsty_threshold5= 0.3 (counts per bin per Lseg); bckgrd_dnsty_threshold6= 0.5 (counts per bin per Lseg) (Source: Inland Water ATBD); (Meanings: [0 1 2 3 4 5 6]) (Values: ['equal_to_or_below_threshold1' 'equal_to_or_below_threshold2' 'equal_to_or_below_threshold3' 'equal_to_or_below_threshold4' 'equal_to_or_below_threshold5' 'equal_to_or_below_threshold6' 'above_threshold6'])
qf_bias_em CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	EM Bias Quality Flag None	1	The Electromagnetic Bias flag is set based on threshold checks for the estimated electromagnetic height bias. The flag is set as follows: -3 if H_bias_EM < -0.10 (m); -2 if -0.10 < H_bias_EM < -0.05; -1 if -0.05 <= H_bias_EM < -0.01; 0 if -0.01 <= H_bias_EM < 0.01 (m); 1 if 0.01 <= H_bias_EM < 0.05; 2 if 0.05 <= H_bias_EM < 0.10; 3 if 0.10 < H_bias_EM; 4 if H_bias_EM is invalid. (Source: Inland Water ATBD); (Meanings: [-3 -2 -1 0 1 2 3 4]) (Values: ['below_threshold1' 'below_threshold2' 'below_threshold3' 'below_threshold4' 'below_threshold5' 'below_threshold6' 'above_threshold6' 'invalid'])
qf_bias_fit CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Height Bias Fit Quality Flag None	1	The height bias fit flag is set based on the value of the goodness of fit bias estimated as the difference between the centroid elevations of the observed surface water histogram and fitted integrated water surface model histogram. The flag values are set as follows: = -3 if H_bias_fit < -0.10 (m); -2 if -0.10 <= H_bias_fit < -0.05;-1 when -0.05 <= H_bias_fit < -0.01; 0 if -0.01 <= H_bias_fit < 0.01 (m); 1 if 0.01 <= H_bias_fit < 0.05; 2 if 0.05 < H_bias_fit < 0.10; 3 if 0.10 <= H_bias_fit; 4 if H_bias_fit is invalid. (Source: Inland Water ATBD); (Meanings: [-3 -2 -1 0 1 2 3 4]) (Values: ['below_threshold1' 'below_threshold2' 'below_threshold3' 'below_threshold4' 'below_threshold5' 'below_threshold6' 'equal_to_or_above_threshold6' 'invalid'])
qf_cloud CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Consolidated cloud flag None	1	This flag is a combination of multiple flags (cloud_flag_atm, cloud_flag_asr, and bsnow_con) and takes daytime/nighttime into consideration. A value of 1 means clouds or blowing snow are likely present. A value of 0 indicates the likely absence of clouds or blowing snow. From the ATL09 data closest to the segment time. (Source: ATL09); (Meanings: [0 1]) (Values: ['likely_clear' 'likely_cloudy'])
qf_ht_adj CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Height adjustment Quality Flag None	1	Flag representing the range of height, defined in 5.3.5 (C), which has been added to the apparent surface height due to frame of reference scaling during deconvolution analysis. (Source: ATL13 ATBD, Section 5.3.5 (C)); (Meanings: [-4 -3 -2 -1 0 1 2 3 4 5]) (Values: ['below_threshold1' 'below_threshold2' 'below_threshold3' 'below_threshold4' 'below_threshold5' 'below_threshold6' 'below_threshold7' 'below_threshold8' 'equal_to_or_above_threshold8' 'invalid'])

qf_ice CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Ice Quality Flag None	1	The quality flag for ice describes the likelihood of ice on the short water body surface segment. 0 for QF_Bckgrd<= 2; 1 for 2 < QF_Bckgrd<= 4; 2 for 4 < QF_Bckgrd; 3 for (4 < QF_Bckgrd and QF_Cloud=1) (Source: Inland Water ATBD); (Meanings: [0 1 2 3]) (Values: ['qf_bckgrd_le_2' 'qf_bckgrd_le_4' 'qf_bckgrd_gt_4' 'qf_bckgrd_w_cloud'])
qf_iwp CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Inland Water Segment Processing Flag None	1	Inland Water segment Processing (IWP) flag to describe the level of processing the inland water algorithm was able to perform on each short segment based on the data available, ranging from 1 to 7. (Source: Inland Water ATBD); (Meanings: [1 2 3 4 5 6 7]) (Values: ['1_short_segment' '2_short_segments' '3_to_5_short_segments' '6_to_7_short_segments' '8_to_9_short_segments' '10_to_29_short_segments' '30_or_more_short_segments_analyzed'])
qf_lseg_length CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Long Segment Length flag None	1	The Long Segment Length flag is set based on the length of the long segment. The flag is set as follows: 0 if Lseg_length < 500 (meters); 1 if 50 <= Lseg_length < 1500 (meters); 2 if 150 <= Lseg_length < 3000 (meters); 3 if 3000 <= Lseg_length (Source: Inland Water ATBD); (Meanings: [0 1 2 3]) (Values: ['below_threshold1' 'below_threshold2' 'below_threshold3' 'above_threshold4'])
qf_spec_width CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Spectral width Flag None	1	Spectral moments width flag. The flag is set as follows: 0 when spec_width is invalid; 1 when 0 <= spec_width <= 0.2; 2 when 0.2 < spec_width <= 0.3; 3 when 0.3 < spec_width <= 0.4; 4 when 0.4 < spec_width <= 0.5; 5 when 0.5 < spec_width <= 0.6; 6 when 0.6 < spec_width <= 0.7; 7 when 0.7 < spec_width <= 0.8; 8 when 0.8 < spec_width <= 0.9; 9 when 0.9 < spec_width. (Source: ATL13 ATBD, Section 4.8.8); (Meanings: [0 1 2 3 4 5 6 7 8 9]) (Values: ['invalid' '0<=spec_width<=0.2' '0.2
qf_sseg_length CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Short Segment Length flag None	1	Length of short segments flag. The flag is set as follows: 0 if sseg_length < 10 (meters); 1 if 10 <= sseg_length < 20 (meters); 2 if 20 <= sseg_length < 30 (meters); 3 if 30 <= sseg_length < 50 (meters); 4 if 50 <= sseg_length < 75 (meters); 5 if 75 <= sseg_length < 100 (meters); 6 if 100 <= sseg_length < 150 (meters); 7 if 150 <= sseg_length < 200 (meters); 8 if 200 <= sseg_length < 300 (meters); 9 if 300 <= sseg_length. (Source: Inland Water ATBD); (Meanings: [0 1 2 3 4 5 6 7 8 9]) (Values: ['below_threshold1' 'below_threshold2' 'below_threshold3' 'below_threshold4' 'below_threshold5' 'below_threshold6' 'below_threshold7' 'below_threshold8' 'below_threshold9' 'equal_to_or_above_threshold9'])
qf_subsurf_anomaly CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Subsurface Anomaly Quality Flag None	1	Describes the likelihood that the bottom or other subsurface anomaly is bottom based on the threshold value at which an anomaly was found. 1 = Subsurface anomaly due to bottom likely; 2 = Subsurface signal may indicate bottom or other anomaly; 3 = Possible subsurface anomaly; invalid = No subsurface anomaly detected (Source: Inland Water ATBD 5.3.4(A)); (Meanings: [1 2 3]) (Values: ['bottom_likely'

				'bottom_or_other_anomaly' 'possible_subsurface_anomaly'])
rgt CHUNKED	INTEGER_2(['Unlimited'])	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: ATL03)
segment_apparent_ht CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Apparent height None	meters	Apparent height of the short segment, before adjustments are made by the algorithm, based on an average of heights within a designated range of the short segment mode. (Source: ATL13 ATBD, Section 5.3.5 (A))
segment_azimuth CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Azimuth azimuth	radians	The direction, eastwards from north, of the laser beam vector as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the vector from the ground to the spacecraft). When the spacecraft is precisely at the geodetic zenith, the value will be 99999 degrees. (Source: ATL13 ATBD, Section 5.3.5 (A))
segment_bias_em CHUNKED	DOUBLE(['Unlimited']) INVALID_R8B	Electromagnetic bias None	meters	Electromagnetic bias. (Has been applied to ht_ortho and _ht_water_surf products) (Source: ATL13 ATBD, Section 5.3.5 (A))
segment_bias_fit CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Goodness of fit bias None	meters	Bias contribution from goodness of observation/system response fit. (Has been applied to ht_ortho and _ht_water_surf products) (Source: ATL13 ATBD, Section 5.3.5 (A))
segment_dac CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Segment DAC None	meters	Dynamic atmospheric correction (DAC) includes inverted barometer (IB) effect (+- 5 cm). Although available at short segment rate for all water body types, value is provided mainly for transitional tidal and coastal water (types 6 and 7) and the largest lakes of Type 1 (~> 10,000 km2) for user's discretion. (Source: ATBD Section 5.3.5A)
segment_dem_ht CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	DEM Height None	meters	DEM height reported at the short segment rate. (Source: ATL13 ATBD, Section 5.3.5)
segment_dem_source CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	dem source flag None	1	Flag equal to the source of the selected photon (in hierarchy of Arctic/Global/MSS/Antarctic). Values: 0=None, 1=Arctic, 2=Global, 3=MSS, 4=Antarctic. (Source: ATL13 ATBD, Section 5.3.5); (Meanings: [0 1 2 3 4]) (Values: ['none' 'arctic' 'global' 'mss' 'antarctic'])
segment_fpb_correction CHUNKED	DOUBLE(['Unlimited']) INVALID_R8B	First photon bias correction None	meters	First photon bias correction. May be applied at user disrection by subtracting from mean height produts ht_ortho and ht_water_surf. (Source: ATL13 ATBD, Section 5.3.5 (A))
segment_full_sat_fract CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Full Saturation Fraction None	1	The fraction of pulses within the short segment determined to be fully saturated based on ATL03 geosegment rate input. (Source: ATL13 ATBD, Section 5.2)
segment_geoid CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Segment Geoid None	meters	Applicable mean-tide system geoid value at reporting location for all short segment statistics. (see geoid_free2mean to convert to the tide-free system.) (Source: ATL03 ATBD, Section 6.3.8)
segment_geoid_free2mean CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Geoid Free-to-Mean	meters	Value to convert segment geoid heights from the mean-tide system to the tide-free system. Subtract

		conversion None		this value from mean-tide system segment_geoid (on ATL13) to get geoid heights in the tide-free system. Applicable value at reporting location for all short segment statistics. (Source: ATL03 ATBD, Section 6.3.8)
segment_id_beg CHUNKED	INTEGER(['Unlimited'])	First ATL03 Segment ID None	1	First ATL03 segment_id associated with the photons within this inland water segment. (Source: ATL03)
segment_id_end CHUNKED	INTEGER(['Unlimited'])	Last ATL03 Segment ID None	1	Last ATL03 segment_id associated with the photons within this inland water segment. (Source: ATL03)
segment_lat CHUNKED	DOUBLE(['Unlimited'])	Latitude latitude	degrees	Latitude of reporting location for all short segment statistics. (Source: ATL13 ATBD, Section 5.3.5 (A))
segment_lon CHUNKED	DOUBLE(['Unlimited'])	Longitude longitude	degrees	Longitude of reporting location for all short segment statistics. (Source: ATL13 ATBD, Section 5.3.5 (A))
segment_near_sat_fract CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Near Saturation Fraction None	1	The fraction of pulses within the short segment determined to be nearly saturated based on ATL03 geosegment rate input. (Source: ATL13 ATBD, Section 5.2)
segment_quality CHUNKED	INTEGER(['Unlimited', 4]) INVALID_I4B	Segment quality group count None	1	Four-element array of describing, for each short segment n, the count of photons qualifying in each quality group. (n,1) = nominal, (n,2) = possible afterpulse, (n,3) = possible impulse response effect, (n,4) = possible TEP (Source: ATL13 ATBD, Table 5-4b)
segment_slope_trk_bdy CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Water Body Slope None	m/m	Along track water body surface slope, reported per short segment ID per water body. (Source: ATL13 ATBD, Section 5.3.5 (A))
segment_tide_earth_free2mean CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Earth Tide Free-to-Mean conversion None	meters	Segment rate value to convert solid earth tide from the tide-free system that was applied in ATL03 to photon heights to the ht_water_surf to the mean-tide system. Subtract value from ht_water_surf to reference it in the mean-tide system. Applicable value at reporting location for all short segment statistics. (Source: ATL03 ATBD, Section 6.3.8)
segment_tide_equilibrium CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Segment Tide Equilibrium None	meters	Long period equilibrium tide self-consistent with ocean tide model (+- 0.04 m). Although available at short segment rate for all water body types, value is provide mainly for transitional tidal and coastal water (types 6 and 7) and the largest lakes of Type 1 (~> 10,000 km2) for user's discretion. (Source: ATL03)
segment_tide_ocean CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Segment Tide Ocean None	meters	Ocean tides including diurnal and semi-diurnal (harmonic analysis (+-4 m)). Although available at short segment rate for all water body types, value is provide mainly for transitional tidal and coastal water (types 6 and 7) and the largest lakes of Type 1 (~> 10,000 km2) for user's discretion. (Source: ATL03)
significant_wave_ht CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	SWH None	meters	Significant wave height (Source: section 5.3.3 (C))
snow_ice_atl09 CHUNKED	INTEGER(['Unlimited']) INVALID_I4B	Snow Ice Flag None	1	NOAA snow/ice flag scaled by ATL09 (0=ice-free water, 1=snow-free land, 2=snow, 3=ice) (Source: ATL13 ATBD, Section 5.3.5 (A)); (Meanings: [0 1 2 3]) (Values: ['ice_free_water' 'snow_free_land' 'snow' 'ice'])
sseg_end_lat CHUNKED	DOUBLE(['Unlimited'])	End latitude latitude	degrees	Latitude at which the short segment ends. May be a signal or non-signal photon.

				(Source: ATL13 ATBD, Section 5.3.2 (C))
sseg_end_lon CHUNKED	DOUBLE(['Unlimited']) 	End longitude longitude	degrees	Longitude at which the short segment ends. May be a signal or non-signal photon. (Source: ATL13 ATBD, Section 5.3.2 (C))
sseg_mean_lat CHUNKED	DOUBLE(['Unlimited']) INVALID_R8B	Mean latitude latitude	degrees	Mean latitude of the signal-qualified photons in a short segment. (Source: ATL13 ATBD, Section 5.3.5 (A))
sseg_mean_lon CHUNKED	DOUBLE(['Unlimited']) 	Mean longitude longitude	degrees	Mean longitude of the signal-qualified photons in a short segment. (Source: ATL13 ATBD, Section 5.3.5 (A))
sseg_mean_time CHUNKED	DOUBLE(['Unlimited']) INVALID_R8B	Mean time time	Seconds since 2018-01-01	Mean time of the signal-qualified photons in a short segment. (Source: ATL13 ATBD, Section 5.3.5 (A))
sseg_start_lat CHUNKED	DOUBLE(['Unlimited']) 	Start latitude latitude	degrees	Latitude at which the short segment begins. May be a signal or non-signal photon. (Source: ATL13 ATBD, Section 5.3.2 (C))
sseg_start_lon CHUNKED	DOUBLE(['Unlimited']) 	Start longitude longitude	degrees	Longitude at which the short segment begins. May be a signal or non-signal photon. (Source: ATL13 ATBD, Section 5.3.2 (C))
stdev_water_surf CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Surface StDev None	meters	Standard deviation of water surface, calculated over long segments with result reported at each short segment location tag contained within. (Source: section 5.3.3 (C))
subsurface_attenuation CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Subsurface Attenuation None	m^-1	Subsurface attenuation coefficient. (Source: section 5.3.4 (A))
transect_id CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Transect ID None	1	Transect within a water body to which the short segment rate output belongs. (Source: ATL13 ATBD, Section 5.3.2 (C))
water_depth CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Water depth None	meters	Depth from the mean water surface to detected bottom. (Source: ATL13 ATBD, Section 5.3.4 (A))
Group: /gtx/anom_ssegs		Contains per-beam anomalous short segment output parameters.		
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
anom_sseg_end_lat CHUNKED	DOUBLE(['Unlimited']) 	End latitude latitude	degrees	End latitude of the anomalous short segment, based on the average latitude of the last sseg_endpoint_avg_n signal photons in the segment. (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_end_lon CHUNKED	DOUBLE(['Unlimited']) 	End longitude longitude	degrees	End longitude of the anomalous short segment, based on the average longitude of the last sseg_endpoint_avg_n signal photons in the segment. (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_ht_delta CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Height difference None	meters	Height difference between anom_sseg_mode of the anomalous short segment and the transect coarse_transect_ht. (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_lat CHUNKED	DOUBLE(['Unlimited']) 	Latitude latitude	degrees	Latitude of the short segment (mean of signal class >=2 ph Lats). (Source: ATL13 ATBD, Section 5.3.5 (A))
anom_sseg_length CHUNKED	DOUBLE(['Unlimited']) INVALID_R8B	Segment length None	meters	Length of the short segment, based on end points computed by the average of sseg_endpoint_avg_n signal photons. (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_lon CHUNKED	DOUBLE(['Unlimited']) 	Longitude longitude	degrees	Longitude of the short segment (mean of signal class >=2 ph Lons).

				(Source: ATL13 ATBD, Section 5.3.5 (A))
anom_sseg_mean_ht_ortho CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Orthometric Height None	meters	Orthometric height of anomalous short segment as determined by the mean of photon orthometric heights in the anomalous short segment with signal classification >2 (Source: ATL13 ATBD, Section 5.3.5 (A))
anom_sseg_mode CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Anomalous mode bin height None	meters	Height of anomalous short segment as determined by histogram bin mode. (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_quality CHUNKED	INTEGER(['Unlimited', 4]) INVALID_I4B	Segment quality group count None	1	Four-element array of describing, for each anomalous short segment n, the count of photons qualifying in each quality group. (n,1) = nominal, (n,2) = possible afterpulse, (n,3) = possible impulse response effect, (n,4) = possible TEP (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_start_lat CHUNKED	DOUBLE(['Unlimited'])	Start latitude latitude	degrees	Start latitude of the anomalous short segment, based on the average latitude of the first sseg_endpoint_avg_n signal photons in the segment. (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_start_lon CHUNKED	DOUBLE(['Unlimited'])	Start longitude longitude	degrees	Start longitude of the anomalous short segment, based on the average longitude of the first sseg_endpoint_avg_n signal photons in the segment. (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_stdev CHUNKED	FLOAT(['Unlimited']) INVALID_R4B	Segment standard deviation None	meters	Standard deviation of anomalous short segment photon height in the anomalous short segment with signal classification >=2. (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_time CHUNKED	DOUBLE(['Unlimited'])	Delta Time time	sec	Time of the short segment (mean of signal class >=2 ph time). (Source: ATL13 ATBD, Table 5-4b)
anom_sseg_trigger_flag CHUNKED	INTEGER_1(['Unlimited', 8]) INVALID_I1B	Anomalous classification flag None	1	Eight element array describing justification for short segment classification as anomalous, where for each element 0 = not triggered as anomalous and 1 = triggered as anomalous due to any of the following causes: [element 1=coarse ht difference, element 2=abnormal length, element 3= histogram mode spread, element 4=histogram mode count, element 5=histogram mode intensity, element 6=invalid long segment, element 7=shore buffer designation, element 8=insufficient signal phs] (Source: ATL13 ATBD, Table 5-4b); (Meanings: [0 1]) (Values: ['not_triggered_as_anomalous' 'triggered_as_anomalous'])
atl13refid CHUNKED	INTEGER_8(['Unlimited']) 0	ATL13 Reference ID None	1	Unique aggregate reference number for each shape in the ATL13 Inland Water Body Mask, where digit 1 = type, digit 2 = size, digit 3 = source, and digits 4-10 = shape id. (Source: ATL13 ATBD, Section 5.3.1 (C))
coarse_transect_ht CHUNKED	DOUBLE(['Unlimited']) INVALID_R8B	Coarse water height None	meters	Coarse water height of transect. (Source: ATL13 ATBD, Table 5-4b)
transect_id CHUNKED	INTEGER_1(['Unlimited']) INVALID_I1B	Transect ID None	1	Transect within a water body to which the short segment rate output belongs. (Source: ATL13 ATBD, Section 5.3.2 (C))
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(['Unlimited'])	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(['Unlimited'])	Cycle Number None	1	A count of the number of exact repeats of this reference orbit. (Source: Operations)
lan CHUNKED	DOUBLE(['Unlimited'])	Ascending Node Longitude None	degrees_east	Longitude at the ascending node crossing. (Source: POD/PPD)
orbit_number CHUNKED	UINT_2_LE(['Unlimited'])	Orbit Number None	1	Unique identifying number for each planned ICESat-2 orbit. (Source: Operations)
rgt CHUNKED	INTEGER_2(['Unlimited'])	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(['Unlimited'])	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(['Unlimited'])	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	Datatype(Dims)	long_name	units	description

(Layout)	Fillvalue	standard_name		
qa_granule_fail_reason COMPACT	INTEGER([1])	Granule Failure Reason None	1	Flag indicating granule failure reason. 0=no failure; 1=processing failure; 2=insufficient data; 3=TBD3; 4=TBD4; 5=TBD5 (Source: Operations); (Meanings: [0 1 2 3 4 5]) (Values: ['no_failure' 'processing_failure' 'insufficient_data' 'TBD3' 'TBD4' 'TBD5'])
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'])