ATL24 Product Data Dictionary

Date Generated : 2025-03-06T15:19:24

Group: /ancillary_data				
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
atlas_sdp_gps_epoch CONTIGUOUS	DOUBLE -	ATLAS Epoch Offset	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
data_end_utc CONTIGUOUS	STRING -	End UTC Time of Granule (CCSDS-A, Actual)	1	UTC (in CCSDS-A format) of the last data point within the granule. **Source:** Derived
data_start_utc CONTIGUOUS	STRING -	Start UTC Time of Granule (CCSDS-A, Actual)	1	UTC (in CCSDS-A format) of the first data point within the granule. **Source:** Derived
end_cycle CONTIGUOUS	INTEGER -	Ending Cycle	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 CONTIGUOUS	DOUBLE -	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 CONTIGUOUS	INTEGER -	Ending Geolocation Segment	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 CONTIGUOUS	DOUBLE -	Ending GPS SOW of Granule (Actual)	seconds	GPS seconds-of-week of the last data point in the granule. **Source:** Derived
end_gpsweek CONTIGUOUS	INTEGER -	Ending GPSWeek of Granule (Actual)	weeks from 1980-01-06	GPS week number of the last data point in the granule. **Source:** Derived
end_orbit CONTIGUOUS	INTEGER -	Ending Orbit Number	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 CONTIGUOUS	INTEGER -	Ending Region	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 CONTIGUOUS	INTEGER -	Ending Reference Groundtrack	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 CONTIGUOUS	STRING -	End UTC Time of Granule (CCSDS-A, Requested)	1	Requested end time (in UTC CCSDS-A) of this granule. **Source:** Derived
granule_start_utc CONTIGUOUS	STRING -	Start UTC Time of Granule (CCSDS-A, Requested)	1	Requested start time (in UTC CCSDS-A) of this granule. **Source:** Derived
release CONTIGUOUS	STRING -	Release Number	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
resource CONTIGUOUS	STRING -	ATL03 Resource	1	ATL03 granule used to produce this granule **Source:** Operations
sliderule_commit CONTIGUOUS	STRING -	SlideRule Commit	1	Git commit ID (https://github.com/SlideRuleEarth/sliderule.git) of SlideRule software used to generate this granule **Source:** Operations
sliderule_environment CONTIGUOUS	STRING -	SlideRule Environment	1	Git commit ID (https://github.com/SlideRuleEarth/sliderule.git) of SlideRule environment used to generate this granule **Source:** Operations
sliderule_version CONTIGUOUS	STRING -	SlideRule Version	1	Version of SlideRule software used to generate this granule **Source:** Operations
start_cycle CONTIGUOUS	INTEGER -	Starting Cycle	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 CONTIGUOUS	DOUBLE -	ATLAS Start Time (Actual)	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 CONTIGUOUS	INTEGER -	Starting Geolocation Segment	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 CONTIGUOUS	DOUBLE -	Start GPS SOW of Granule (Actual)	seconds	GPS seconds-of-week of the first data point in the granule. **Source:** Derived
start_gpsweek CONTIGUOUS	INTEGER -	Start GPSWeek of Granule (Actual)	weeks from 1980-01-06	GPS week number of the first data point in the granule. **Source:** Derived
start_orbit CONTIGUOUS	INTEGER -	Starting Orbit Number	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 CONTIGUOUS	INTEGER -	Starting Region	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 CONTIGUOUS	INTEGER -	Starting Reference Groundtrack	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 CONTIGUOUS	STRING -	Version	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: /gt1l				
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
class_ph CHUNKED	INTEGER_1(:) -	Photon classification	scalar	0 - unclassified, 1 - other, 40 - bathymetry, 41 - sea surface **Source:** ATL03
confidence CHUNKED	DOUBLE(:) -	Ensemble confidence	scalar	ensemble confidence score from 0.0 to 1.0 where larger numbers represent higher confidence in classification **Source:** ATL03
delta_time CHUNKED	DOUBLE(:) -	Elapsed GPS seconds	seconds since 2018-01-01	The transmit time of a given photon, measured in seconds from the ATLAS Standard Data Product Epoch. Note that multiple received photons associated with a single transmit pulse will have the same delta_time. 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
ellipse_h CHUNKED	FLOAT(:) -	Photon WGS84 height	meters	Height of each received photon, relative to the WGS-84 ellipsoid including refraction correction. Note neither the geoid, ocean tide nor the dynamic atmosphere (DAC) corrections are applied to the ellipsoidal heights. **Source:** ATL03
index_ph CHUNKED	INTEGER(:) -	Photon index	scalar	0-based index of the photon in the ATL03 heights group **Source:** ATL03
index_seg CHUNKED	INTEGER(:) -	Segment index	scalar	0-based index of the photon in the ATL03 geolocation group **Source:** ATL03
invalid_kd CHUNKED	UINT_1_LE(:) -	Invalid Kd	boolean	No data was available in the VIIRS Kd490 8-day cycle dataset at the time and location of the photon **Source:** ATL03
invalid_wind_speed CHUNKED	UINT_1_LE(:) -	Invalid wind speed	boolean	ATL09 data was not able to be read to determine wind speed **Source:** ATL03
lat_ph CHUNKED	DOUBLE(:) -	Latitude latitude	degrees_north	Latitude of each received photon. Computed from the ECF Cartesian coordinates of the bounce point. **Source:** ATL03
lon_ph CHUNKED	DOUBLE(:) -	Longitude longitude	degrees_east	Longitude of each received photon. Computed from the ECF Cartesian coordinates of the bounce point. **Source:** ATL03
low_confidence_flag CHUNKED	UINT_1_LE(:) -	Low confidence bathymetry flag	boolean	There is low confidence that the photon classified as bathymetry is actually bathymetry **Source:** ATL03

night_flag CHUNKED	UINT_1_LE(:) -	Night flag	boolean	The solar elevation was less than 5 degrees at the time and location of the photon **Source:** ATL03
ortho_h CHUNKED	FLOAT(:) -	Orthometric height	meters	Height of each received photon, relative to the geoid. **Source:** ATL03
sensor_depth_exceeded CHUNKED	UINT_1_LE(:) -	Sensor depth exceeded	boolean	The subaqueous photon is below the maximum depth detectable by the ATLAS sensor given the Kd of the water column **Source:** ATL03
sigma_thu CHUNKED	FLOAT(:) -	Total horizontal uncertainty	meters	The combination of the aerial and subaqueous horizontal uncertainty for each received photon **Source:** ATL03
sigma_tvu CHUNKED	FLOAT(:) -	Total vertical uncertainty	meters	The combination of the aerial and subaqueous vertical uncertainty for each received photon **Source:** ATL03
surface_h CHUNKED	FLOAT(:) -	Sea surface orthometric height	meters	The geoid corrected height of the sea surface at the detected photon **Source:** ATL03
x_atc CHUNKED	DOUBLE(:) -	Distance from equator crossing	meters	Along-track distance in a segment projected to the ellipsoid of the received photon, based on the Along-Track Segment algorithm. Total along track distance can be found by adding this value to the sum of segment lengths measured from the start of the most recent reference groundtrack. **Source:** ATL03
y_atc CHUNKED	FLOAT(:) -	Distance off RGT	meters	Across-track distance projected to the ellipsoid of the received photon from the reference ground track. This is based on the Along-Track Segment algorithm described in Section 3.1 of the ATBD. **Source:** ATL03
Group: /metadata				
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
extent CONTIGUOUS	STRING -	Query MetaData	json	geospatial and temporal extents **Source:** Derived
profile CONTIGUOUS	STRING -	Algorithm RunTimes	json	runtimes of the various algorithms **Source:** Derived
sliderule CONTIGUOUS	STRING -	SlideRule MetaData	json	sliderule server and request information **Source:** Derived
stats CONTIGUOUS	STRING -	Granule Metrics	json	granule level statistics **Source:** Derived
Group: /orbit_info				
Label (Layout)	Datatype(Dims) Fillvalue	long_name standard_name	units	description
crossing_time CONTIGUOUS	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 CONTIGUOUS	INTEGER_1 -	Cycle Number	counts	Tracks the number of 91-day cycles in the mission, beginning with 01. A unique orbit number can be determined by subtracting 1 from the cycle_number, multiplying by 1387 and adding the rgt value. **Source:** POD/PPD
lan CONTIGUOUS	DOUBLE -	Ascending Node Longitude	degrees_east	Longitude at the ascending node crossing. **Source:** POD/PPD
orbit_number CONTIGUOUS	INTEGER_2 -	Orbit Number	1	Unique identifying number for each planned ICESat-2 orbit. **Source:** Operations
rgt CONTIGUOUS	INTEGER_2 -	Reference Ground Track	counts	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

				GT2L and GT2R. 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 CONTIGUOUS	INTEGER_1 -	Spacecraft Orientation	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 **Flags:** 0()=backward, 1()=forward, 2()=transition
sc_orient_time CONTIGUOUS	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