GLAH06 Product Data Dictionary

File-Level (Global) Attributes

Attribute	Example Value
featureType	timeSeries
ShortName	GLAH06
title	GLAS/ICESat L1B Global Elevation Data (HDF5)
comment	Data granules contain approximately 23 minutes (1/4 orbit) and include the surface elevation, surface roughness assuming no slope, surface slope assuming no roughness and geodetic and atmospheric corrections for the range at the full 40/sec resolution.
summary	Scientists investigating surface elevation, slope, reflection, and other surface characteristics can use the GLAH06 data. The data values were used in the creation of the surface-specific altimeter products (GLAH12-15). Each GLAH06 file was created from an equivalent GLA06 binary formatted file. Users that want to access the data used to create the GLAH06 values can use the equivalent GLAHxx files for the GLAxx files as shown in the provenance metadata for the history that created the GLA06.
license	http://nsidc.org/data/icesat/disclaimer.html
references	http://nsidc.org/data/docs/daac/glas_icesat_l1_l2_global_altimetry.gd.html (Guide Document for this product at NSIDC), http://nsidc.org/daac/icesat/index.html (GLAS Product page at NSIDC)
AccessConstraints	Data may not be reproduced or distributed without including the CitationForExternalPublication for this product included in this Metadata. Data may not be distributed in an altered form without the written permission of the GLAS Science Team.
CitationforExternalPublication	The data used in this study were produced by the GLAS Science Team at the ICESat Science Investigator-led Processing System (I-SIPS) at NASA/GSFC. The data archive site is the NSIDC DAAC.
contributor_role	Data Originator, Investigator, Producer, Producer
contributor_name	David W. Hancock (David.W.Hancock@nasa.gov), Bob E Schutz (schutz@utcsr.ae.utexas.edu), Jay Zwally (Jay.Zwally@nasa.gov), John P DiMarzio (John.P.Dimarzio.1@nasa.gov)
creator_name	ICESat Science Investigator-led Processing System (I-SIPS)
creator_email	David.W.Hancock@nasa.gov
publisher_name	NSIDC User Services
publisher_email	nsidc@nsidc.org
publisher_url	http://nsidc.org/daac/icesat/index.html
platform	Ice, Cloud, and Land Elevation Satellite (ICESat)
instrument	Geoscience Laser Altimeter System (GLAS)
processing_level	1B
date_created	2013-01-16T18:57:52
spatial_coverage_type	Horizontal
history	2011-09-17T02:59:51 glas_alt 6.0.1 GLA06_633_2123_002_0141_1_01_0001.DAT, 2013-01-16T18:57:52.000000Z GLA06_h5_convert Version 1.2 (January 2013) ./GLAH06_633_2123_002_0141_1_01_0001.H5
geospatial_lat_min	-90.0
geospatial_lat_max	90.0
geospatial_lon_min	-180.0
geospatial_lon_max	180.0
geospatial_lat_units	degrees_north
geospatial_lon_units	degrees_east
keywords	Earth Science > Land Surface > Topography > Terrain Elevation > Laser Reflectance, Earth Science > Land Surface > Topography > Surface Roughness > Laser Reflectance, Earth Science > Cryosphere > Glaciers/Ice Sheets > Glacier Elevation/Ice Sheet Elevation > Laser Reflectance, Earth Science > Hydrosphere > Glaciers/Ice Sheets > Glacier Elevation/Ice Sheet Elevation, Earth Science > Oceans > Sea Surface Topography > Sea Surface Slope > Laser Reflectance, Earth Science > Cryosphere > Sea Ice > Reflectance > Laser Reflectance, Earth Science > Land Surface > Surface Radiative Properties > Reflectance > Laser Reflectance, Earth Science > Oceans > Sea Ice > Reflectance > Laser Reflectance, Earth Science > Cryosphere > Sea Ice > Ice Roughness, Earth Science > Oceans > Sea Ice > Ice Roughness, Earth Science > Oceans > Sea Surface Topography > Sea Surface Height
keywords_vocabulary	GCMD Science Keywords Version 6.0
standard_vocabulary_name	CF-1.6
naming_authority	http://dx.doi.org
project	Ice, Cloud, and Land Elevation Satellite (GLAS_HDF)
time_type	UTC
date_type	J2000
time_coverage_start	2008-03-03T02:51:46
time_coverage_end	2008-03-03T03:13:12
time_coverage_duration	1620
source	Satellite Measurements
HDFVersion	HDF5 1.8.9
identifier_file_uuid	04D42283-3EE8-40A8-A488-AE95192F7F20
identifier_product_doi	10.5067/ICESAT/GLAS/DATA106

identifier_product_type	GLAH06
identifier_product_format_version	1.0
Conventions	CF-1.6
institution	National Aeronautics and Space Administration (NASA)

Group: /Data_1HZ

This group contains data with a rate of 1HZ. 1Hz data may be indexed to the 40HZ data using the i_rec_ndx parameter in each respective time group.

Dimension Scales

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
DS_UTCTime_1	DOUBLE (UNLIMITED)	Transmit Time of First Shot in frame in J2000 (time)	seconds since 2000-01-01 12:00:00 UTC	The transmit time of the first shot in the 1 second frame measured as UTC seconds elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds.	Rel 33 GLAS Binary Data	NOT_SET

Group: Data_1HZ/Time

This group contains the 1HZ index and time-related parameters

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
i_rec_ndx	INTEGER (UNLIMITED)	GLAS Record Index (NOT_SET)	NOT_SET	Unique index that relates this record to the corresponding record(s) in each GLAS data product.	Rel 33 GLAS Binary Data	DS_UTCTime_1
i_shot_count	INTEGER (UNLIMITED)	GLAS Pulse Index (NOT_SET)	NOT_SET	Identifies each laser shot within a record index. A combination of i_rec_ndx and i_shot_count can be used to uniquely identify each GLAS laser shot.	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_transtime	DOUBLE (UNLIMITED)	One way transit time (NOT_SET)	seconds	One way transit time calculated using the preliminary range offset. This is added to the UTC time tag to get the ground bounce times at which to calculate the orbit	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_deltagpstmcor	DOUBLE (UNLIMITED)	Delta GPS time correction (NOT_SET)	seconds	The high frequency delta GPS time correction calculated during the precision orbit processing step.	Rel 33 GLAS Binary Data	DS_UTCTime_1
shot_time_flg	INTEGER_1 (UNLIMITED)	time correction flag (NOT_SET)	NOT_SET	Shot time flag; Indicates what shot time is used. **flag_values**: 0, 1 **flag_meanings**: transmit_time ground_bounce_time	Rel 33 GLAS Binary Data	DS_UTCTime_1
gps_time_flg	INTEGER_1 (UNLIMITED)	time correction flag (NOT_SET)	NOT_SET	GPS time flag; Indicates if delta gps time correction is applied to shot time **flag_values**: 0, 1 **flag_meanings**: not_applied applied	Rel 33 GLAS Binary Data	DS_UTCTime_1
pl_timing_flg	INTEGER_1 (UNLIMITED)	time correction flag (NOT_SET)	NOT_SET	Post-launch timing; indicates if post-launch timing bias is applied. Data value is stored in the Metadata group. **flag_values**: 0, 1 **flag_meanings**: not_applied applied	Rel 33 GLAS Binary Data	DS_UTCTime_1
ddelay_flg	INTEGER_1 (UNLIMITED)	time correction flag (NOT_SET)	NOT_SET	Digitizer turn-on delay flag; Indicates if digitizer turn-on delay is accounted for in shot time. Data value is stored in the Metadata group. **flag_values**: 0, 1 **flag_meanings**: applied not_applied	Rel 33 GLAS Binary Data	DS_UTCTime_1
peaktp_flg	INTEGER_1 (UNLIMITED)	time correction flag (NOT_SET)	NOT_SET	Peak of transmit pulse flag; Indicates if time to peak of transmit pulse is accounted for in shot time. **flag_values**: 0, 1 **flag_meanings**: applied not_applied	Rel 33 GLAS Binary Data	DS_UTCTime_1

Group: Data_1HZ/Geolocation

This group contains geolocation-related parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_lat	DOUBLE (UNLIMITED)	Spot 1 Coordinate Data, Latitude Corrected (latitude)	degrees_north	The geodetic latitude of the laser spot computed from the precision orbit, precision attitude, and ice-sheet specific range after instrument corrections, atmospheric delays and tides have been applied. The values are in degrees north.	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_lon	DOUBLE (UNLIMITED)	Spot 1 Coordinate Data, Longitude Corrected (longitude)	degrees_east	The longitude of the laser spot computed from the Precision orbit, precision attitude, and ice-sheet specific range after instrument corrections, atmospheric delays and tides have been applied. The values are in degrees east.	Rel 33 GLAS Binary Data	DS_UTCTime_1
i_track	INTEGER (UNLIMITED)	Track (NOT_SET)	NOT_SET	The track number.	Rel 33 GLAS Binary Data	DS_UTCTime_1

Group: Data_1HZ/Packet_data

This group contains flags indicating packet availability.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
apid_ADLg_1_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Altimeter Digitizer large wf packet APID availability flag for 1st 10 shots. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ADLg_2_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Altimeter Digitizer large wf packet APID availability flag for 2nd 10 shots. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ADLg_3_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Altimeter Digitizer large wf packet APID availability flag for 3rd 10 shots. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ADLg_4_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Altimeter Digitizer large wf packet APID availability flag for 4th 10 shots. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ADSm_1_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Altimeter Digitizer small wf packet APID availability flag for 1st 10 shots. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ADSm_2_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Altimeter Digitizer small wf packet APID availability flag for 2nd 10 shots. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ADSm_3_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Altimeter Digitizer small wf packet APID availability flag for 3rd 10 shots. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ADSm_4_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Altimeter Digitizer small wf packet APID availability flag for 4th 10 shots. flag_values flag_meanings	Rel 33 GLAS Binary Data	DS_UTCTime_1

				0, 1, 2 present filled_at_EDOS never_received_ISIPS_filled		
apid_PC532_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	532 Photon counter packet APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_CD1064_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	1064 Cloud Digitizer packet APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ADSci_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Ancillary science packet APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ASAD_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Altimeter Digitizer telemetry data in Ancillary science packet APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ASPC_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Photon counter telemetry data in Ancillary science packet APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ASCF_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Cloud Digitizer telemetry data in Ancillary science packet APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_ASCT_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	C&T board telem. data in Ancillary science packet APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_CT20_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	CT HW telemetry packet #1 (APID 20) APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_CT21_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	CT HW telemetry packet #2 (APID 21) APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_CT22_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	CT HW telemetry packet #3 (APID 22) APID availability flag. flag_values: 0, 1, 2 flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_CT23_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	CT HW telemetry packet #4 (APID 23) APID availability flag. flag_values:	Rel 33 GLAS Binary Data	DS_UTCTime_1

				0, 1, 2: present filled_at_EDOS never_received_ISIPS_filled		
apid_CT50_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	CT HW telemetry packet #5 (APID 50) APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_SS24_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Small software telemetry packet #1 (APID 24) APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_LS25_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Large software telemetry packet #1 (APID 25) APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_LS55_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Large software telemetry packet #2 (APID 55) APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_GPS_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	GPS telemetry packet APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_PRAP_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	S/C position, rate, and attitude telemetry packet (PRAP) APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_LPA_1_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	LPA packet #1 APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_LPA_2_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	LPA packet #2 APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_LPA_3_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	LPA packet #3 APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1
apid_LPA_4_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	LPA packet #4 APID availability flag. flag_values: 0, 1, 2 — flag_meanings: present filled_at_EDOS never_received_ISIPS_filled	Rel 33 GLAS Binary Data	DS_UTCTime_1

Group: Data_1HZ/Quality

This group contains data quality flags and related parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates

orbit_pred_flg	INTEGER_1 (UNLIMITED)	POD flag (Orbit Flag) (NOT_SET)	NOT_SET	Predicted or precision orbit flag. **flag_values**: 0, 1, 2 **flag_meanings**: precision_orbit_used predicted_orbit_used onboard_orbit_used	Rel 33 GLAS Binary Data	DS_UTCTime_1
orbit_man_flg	INTEGER_1 (UNLIMITED)	Maneuver flag (NOT_SET)	NOT_SET	If maneuvers occurred, orbit is considered degraded. **flag_values**: 0, 1 **flag_meanings**: no_maneuvers maneuvers_occurred_during_this_record	Rel 33 GLAS Binary Data	DS_UTCTime_1
orbit_model_flg	INTEGER_1 (UNLIMITED)	Model problems flag. (NOT_SET)	NOT_SET	model_problems indicated when orbit RMS > 5 cm; indicates required accuracy not met. **flag_values**: 0, 1 **flag_meanings**: no_model_problems model_problems	Rel 33 GLAS Binary Data	DS_UTCTime_1
orbit_att_flg	INTEGER_1 (UNLIMITED)	Attitude flag (NOT_SET)	NOT_SET	modeled_attitude_used indicates possible orbit degradation. **flag_values**: 0, 1 **flag_meanings**: instrument_attitude_used_for_orbit modeled_attitude_used	Rel 33 GLAS Binary Data	DS_UTCTime_1
orbit_array_flg	INTEGER_1 (UNLIMITED)	Solar Array Orientation flag (NOT_SET)	NOT_SET	modeled_solar_ray_orientation indicates possible orbit degradation **flag_values**: 0, 1 **flag_meanings**: solar_ray_orientation_used_from measurement modeled_solar_ray_orientation	Rel 33 GLAS Binary Data	DS_UTCTime_1
orbit_gps_flg	INTEGER_1 (UNLIMITED)	GPS Flag (NOT_SET)	NOT_SET	GPS_data_missing indicates GPS data missing from portion of this record and possible degradation. **flag_values**: 0, 1 **flag_meanings**: no_GPS_data_outage GPS_data_missing	Rel 33 GLAS Binary Data	DS_UTCTime_1
att_offnadir_flg	INTEGER_1 (UNLIMITED)	Attitude Flag 1 (NOT_SET)	NOT_SET	Off-nadir angle flag; Indicates if off-nadir angle is within limits. **flag_values**: 0, 1 **flag_meanings**: within_limit outside_limits	Rel 33 GLAS Binary Data	DS_UTCTime_1
att_oceansw_flg	INTEGER_1 (UNLIMITED)	Attitude Flag 1 (NOT_SET)	NOT_SET	Ocean sweep flag; Indicates if an ocean sweep is within the time frame of this record. **flag_values**: 0, 1 **flag_meanings**: not_ocean_sweep ocean_sweep	Rel 33 GLAS Binary Data	DS_UTCTime_1
att_pointing_flg	INTEGER_1 (UNLIMITED)	Attitude Flag 1 (NOT_SET)	NOT_SET	Target of opportunity off-pointing flag; Indicates if this record is within time of target of opportunity off-pointing. **flag_values**: 0, 1 **flag_meanings**: not_pointing pointing	Rel 33 GLAS Binary Data	DS_UTCTime_1
att_steering_flg	INTEGER_1 (UNLIMITED)	Attitude Flag 1 (NOT_SET)	NOT_SET	Steering to reference track flag; Indicates if this record is within target of opportunity off-pointing. **flag_values**: 0, 1 **flag_meanings**: not_pointing pointing	Rel 33 GLAS Binary Data	DS_UTCTime_1
att_actual_flg	INTEGER_1 (UNLIMITED)	Attitude Flag 1 (NOT_SET)	NOT_SET	Actual data bits flag; Indicates if the first 3 Attitide Flags have been set based on actual data, if ignore, then IGNORE those bits. **flag_values**: 0, 1 **flag_meanings**: actual ignore	Rel 33 GLAS Binary Data	DS_UTCTime_1
att_ist_flg	INTEGER_1 (UNLIMITED)	Attitude Flag 1 (NOT_SET)	NOT_SET	IST data flag; Indicates if IST data are good, missing for at least a portion of the time of this frame, noisy for at least a	Rel 33 GLAS	DS_UTCTime_1

				portion of the time of this frame or noisy and missing for at least a portion of the time of this frame. **flag_values**: 0, 1, 2, 3 **flag_meanings**: good missing noisy missing_noisy	Binary Data	
att_gyro_flg	INTEGER_1 (UNLIMITED)	Attitude Flag 1 (NOT_SET)	NOT_SET	GYRO data flag; Indicates if GYRO data are good, missing for at least a portion of the time of this frame, noisy for at least a portion of the time of this frame or noisy and missing for at least a portion of the time of this frame. **flag_values**: 0, 1, 2, 3 **flag_meanings**: good missing noisy missing_noisy	Rel 33 GLAS Binary Data	DS_UTCTime_1
att_lrs_flg	INTEGER_1 (UNLIMITED)	Attitude Flag 1 (NOT_SET)	NOT_SET	LRS Data flag; Indicates the following conditions: LRS data good, consists of star, laser and CRS; LRS data good, but no star data for at least a portion of this frame; LRS data good, but no laser data for at least a portion of this frame; LRS data good, but no CRS data for at least a portion of this frame; LRS data good, but only CRS data for at least a portion of this frame; LRS data good, but only laser data for at least a portion of this frame; LRS data good, but only star data for at least a portion of this frame; Missing LRS for at least a portion of the time of this frame. **flag_values**: 0, 1, 2, 3, 4, 5, 6, 7 **flag_meanings**: good no_star no_laser no_crs only_crs only_laser only_star missing_lrs	Rel 33 GLAS Binary Data	DS_UTCTime_1
altfrm_corr_flg	INTEGER_1 (UNLIMITED)	Altimeter Frame Quality Flag (NOT_SET)	NOT_SET	Corrections flag; Indicates if all data in frame are good with appropriate corrections applied; or if some of data are not corrected or have measurement problems. **flag_values**: 0, 1 **flag_meanings**: good uncorrected	Rel 33 GLAS Binary Data	DS_UTCTime_1
altfrm_data_flg	INTEGER_1 (UNLIMITED)	Altimeter Frame Quality Flag (NOT_SET)	NOT_SET	Frame data flag; Indicates if there are at least some usable data in the frame; or if all elevations in the frame are bad due to problems with corrections. **flag_values**: 0, 1 **flag_meanings**: good not_good	Rel 33 GLAS Binary Data	DS_UTCTime_1
altfrm_meas_flg	INTEGER_1 (UNLIMITED)	Altimeter Frame Quality Flag (NOT_SET)	NOT_SET	Measurements flag; Indicates if all GLAS measurements are good or if there is at least one unusable measurement in the frame. **flag_values**: 0, 1 **flag_meanings**: good not_good	Rel 33 GLAS Binary Data	DS_UTCTime_1
altfrm_use_flg	INTEGER_1 (UNLIMITED)	Altimeter Frame Quality Flag (NOT_SET)	NOT_SET	Usable Measurements flag; Indicates if there is at least one usable measurement in the frame; or if all GLAS measurements are bad. **flag_values**: 0, 1 **flag_meanings**: usable not_usable	Rel 33 GLAS Binary Data	DS_UTCTime_1

Group: Data_1HZ/Transmit_Energy

This group contains information relating to transmit energy.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_tpintensity_avg	DOUBLE (UNLIMITED)	Transmit Pulse intensity - frame avg (NOT_SET)	NOT_SET	Transmit pulse intensity as measured by the LPA. Averaged over the 1-second frame. From ANC09.	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_tpazimuth_avg	DOUBLE (UNLIMITED)	Transmit Pulse azimuth - frame avg (NOT_SET)	degrees	Transmit pulse azimuth. Averaged over the 1-second frame. Angle eastwards from north of the major axis of the transmit pulse, as seen by the LPA. From ANC09.	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_tpeccentricity_avg	DOUBLE (UNLIMITED)	Transmit Pulse eccentricity - frame avg (NOT_SET)	NOT_SET	Transmit pulse eccentricity as measured by the LPA. Averaged over the 1-second frame. From ANC09.	Rel 33 GLAS Binary Data	DS_UTCTime_1

d_tpmajoraxis_avg	DOUBLE (UNLIMITED)	Transmit Pulse major axis - frame avg (NOT_SET)	meters	Trasmit pulse major axis as measured by the LPA. Averaged over the 1-second time frame. From ANC09.	Rel 33 GLAS Binary Data	DS_UTCTime_1

Group: Data_1HZ/Reflectivity

This group contains reflectivity information.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_localSolarTime	DOUBLE (UNLIMITED)	Local apparent solar time (NOT_SET)	seconds	Local apparent solar time.	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_Azimuth	DOUBLE (UNLIMITED)	Local Azimuth (solar_azimuth_angle)	degrees	Mean azimuth measured clockwise from north based on latitude, longitude, and elevation of a 1 second interval of the trace of the ground footprint-center.	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_SolAng	DOUBLE (UNLIMITED)	Solar Angle (NOT_SET)	degrees	Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_reflCor_atm	DOUBLE (UNLIMITED)	Reflectivity Correction Factor For Atmospheric Effects (NOT_SET)	NOT_SET	This reflectance correction factor is calculated as 1 / e^(-2(tc+ta+tp+tm)), where tc is the cloud (column) integrated optical depth, ta is the aerosol (column) integrated optical depth, tp is the planetary boundary layer optical depth, and tm is the molecular optical depth. tm is a constant equal to -log(gd_T_RTatm)/2, where gd_T_RTatm = 0.98 is defined in const_elev_mod.f90 or read from ANC07-03. The attenuation correction factor has been corrected for multiple scattering. The reflectance has been corrected for waveform saturation.	Rel 33 GLAS Binary Data	DS_UTCTime_1

Group: Data_1HZ/Elevation_Flags

This group contains flags indicating the quality or suitability of elevation data.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
surf_ld_flg	INTEGER_1 (UNLIMITED)	Region Type - Land (NOT_SET)	NOT_SET	Land flag - 1 = presence of land in the region. flag_values: 0, 1 flag_meanings: no_land land	Rel 33 GLAS Binary Data	DS_UTCTime_1
surf_si_flg	INTEGER_1 (UNLIMITED)	Region Type - Sea Ice (NOT_SET)	NOT_SET	Sea Ice flag, 1 = presence of sea ice in the region. flag_values: 0, 1 flag_meanings: no_sea_ice sea_ice	Rel 33 GLAS Binary Data	DS_UTCTime_1
surf_oc_flg	INTEGER_1 (UNLIMITED)	Region Type - Ocean (NOT_SET)	NOT_SET	Ocean flag, 1 = presence of ocean in the region. flag_values: 0, 1 flag_meanings: no_ocean ocean	Rel 33 GLAS Binary Data	DS_UTCTime_1
surf_is_flg	INTEGER_1 (UNLIMITED)	Region Type - Ice Sheet (NOT_SET)	NOT_SET	Ice Sheet flag, 1 = presence of ice sheet in the region. flag_values: 0, 1 flag_meanings: no_ice_sheet ice_sheet	Rel 33 GLAS Binary Data	DS_UTCTime_1
rng_ldtide_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag - Load Tides (NOT_SET)	NOT_SET	Load tides flag; 0 = a correction for the dynamic effect of load tides has been applied to the range before the elevation was calculated. flag_values: 0, 1 flag_meanings: applied not_applied	Rel 33 GLAS Binary Data	DS_UTCTime_1
rng_octide_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag - Ocean Tides (NOT_SET)	NOT_SET	Ocean tides flag; 0 = a correction for the dynamic effect of ocean tides has been applied to the range before the elevation was calculated. flag_values: 0, 1 flag_meanings: applied not_applied	Rel 33 GLAS Binary Data	DS_UTCTime_1

rng_setide_flag	INTEGER_1 (UNLIMITED)	Range Correction Flag - Solid Earth Tides (NOT_SET)	NOT_SET	Solid earth tides flag; 0 = a correction for the dynamic effect of solid earth tides has been applied to the range before the elevation was calculated. flag_values: 0, 1 flag_meanings: applied not_applied	Rel 33 GLAS Binary Data	DS_UTCTime_1
rng_drytrop_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag - Dry Troposphere (NOT_SET)	NOT_SET	Dry troposphere flag; 0 = a correction for propagation errors due to the dry troposphere was applied to the range before the elevation was calculated. flag_values: 0, 1 flag_meanings: applied not_applied	Rel 33 GLAS Binary Data	DS_UTCTime_1
rng_wettrop_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag - Wet Troposphere (NOT_SET)	NOT_SET	Wet troposphere flag; 0 = a correction for propagation errors due to the wet troposphere was applied to the range before the elevation was calculated. flag_values: 0, 1 flag_meanings: applied not_applied	Rel 33 GLAS Binary Data	DS_UTCTime_1
rng_intbias_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag - Internal Range Bias (NOT_SET)	NOT_SET	Internal range bias flag; 0 = the internal range bias was applied to the range before the elevation was calculated and if the value of d_refRng on the record has this correction applied. flag_values: 0, 1 flag_meanings: applied not_applied	Rel 33 GLAS Binary Data	DS_UTCTime_1
rng_plbias_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag - Post-launch Range Bias (NOT_SET)	NOT_SET	Post-launch range bias flag; 0 = the post-launch range bias was applied to the range before the elevation was calculated and if the value of d_refRng on the record has this correction applied. flag_values: 0, 1 flag_meanings: applied not_applied	Rel 33 GLAS Binary Data	DS_UTCTime_1
rng_model_flg	INTEGER_1 (UNLIMITED)	Correction Status Flag - Range Model (NOT_SET)	NOT_SET	Geophysical corrections flag; Indicates if the load and ocean tides are from 0=global model, 1=regional model no. 1, 2=regional model no. 2, or 3=regional model no. 3 flag_values: 0, 1, 2, 3 flag_meanings: global model_1 model_2 model_3	Rel 33 GLAS Binary Data	DS_UTCTime_1
rng_oldmet_flg	INTEGER_1 (UNLIMITED)	Correction Status Flag - Old MET (NOT_SET)	NOT_SET	Geophysical corrections flag; Indicates if 0=troposphere corrections are based on 6hr NCEP grids surrounding data, 1=6hr NCEP grids but at least one was >6 but <24 hrs away from data, 2=standard atm, or 3=reanalyzed met data. flag_values: 0, 1, 2, 3 flag_meanings: 6_hour over_6_hour standard_atm reanalyzed	Rel 33 GLAS Binary Data	DS_UTCTime_1
rng_atmcorr_flg	INTEGER_1 (UNLIMITED)	Correction Status Flag - Reflectivity (NOT_SET)	NOT_SET	Geophysical corrections flag; Indicates values used to calculate corrected reflectivity - 0=computed aerosol and cloud optical depths used, 1=default-null aerosol and computed cloud optical depths, 2=computed aerosol and default-null cloud optical depths, 3=default-null values for aerosol and cloud optical depths, or 4=maximum bound set. flag_values: 0, 1, 2, 3, 4 flag_meanings: computed only_od only_aerosol defaults max_bound_set	Rel 33 GLAS Binary Data	DS_UTCTime_1

Group: Data_1HZ/Atmosphere

This group contains atmosphere information and flags.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
atm_gla11_flg	INTEGER_1 (UNLIMITED)	Atmosphere Availability Flag - GLA11 (NOT_SET)	NOT_SET	GLA11 data availability flag; 0 = available. flag_values flag_meanings	Rel 33 GLAS Binary Data	DS_UTCTime_1

				0, 1 | available not_available		
atm_gla09_flg	INTEGER_1 (UNLIMITED)	Atmosphere Availability Flag - GLA09 (NOT_SET)	NOT_SET	GLA09 data availability flag; 0 = available. flag_values: 0, 1 | flag_meanings: available not_available	Rel 33 GLAS Binary Data	DS_UTCTime_1
atm_char_flag	INTEGER_1 (UNLIMITED)	Atmosphere Characterization Flag (NOT_SET)	NOT_SET	Flag to characterize cloud and blowing snow state of the atmosphere based on combinations of hi_cloud (> 5 km), mid_cloud (>2, <=5 km), low cloud (> 500 m, <=2 km), blowing snow or fog and hi/lo optical depth. Additional values indicate if the characterization was not tested or if the data quality was insufficient to assign a flag. flag_values: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | flag_meanings: clear hi_cloud_low_od hi_cloud_high_od mid_cloud_low_od mid_cloud_hi_od low_cloud_low_od low_cloud_hi_od blowing_snow_low_od blowing_snow_hi_od not_tested insufficient	Rel 33 GLAS Binary Data	DS_UTCTime_1
atm_char_conf	INTEGER_1 (UNLIMITED)	Atmosphere Characterization Flag Confidence (NOT_SET)	NOT_SET	Confidence level ascribed to the atmosphere characterization flag. 0=not applicable (for contamination flag values of 9 or 10). 1: low confidence. 2: reasonable confidence. 3: high confidence. flag_values: 0, 1, 2, 3 | flag_meanings: not_applicable low_confidence reasonable_confidence high_confidence	Rel 33 GLAS Binary Data	DS_UTCTime_1
cld1_mswf_flg	INTEGER_1 (UNLIMITED)	Cloud Multiple Scattering Warning Flag (NOT_SET)	NOT_SET	The multiple scattering warning flag (MSWF) is based on the total column optical depth (aerosol plus cloud) calculated in GLA11 using 532nm. It is intended as a way to quickly obtain information about the potential severity of multiple scattering with regards to the range-to-surface calculated by the altimetry processing software. The multiple scattering warning flag will have values ranging from 0-14, based on the total column optical depth. A warning flag value of 15 will signify invalid. An invalid will be encoded if an optical depth in any of the layers in the 1-second column could not be calculated. This usually occurs in a very optically thick cloud which extinguishes the signal. It could also occur if the extinction-to-backscatter ratio assignment is set too high, causing the transmission calculations in the lidar inversion to go out-of-range. flag_values: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 | flag_meanings: under_0.010 0.010_0.030 0.030_0.060 0.060_0.100 0.100_0.150 0.150_0.225 0.225_0.300 0.300_0.400 0.400_0.500 0.500_0.670 0.670_0.900 0.900_1.200 1.200_1.600 1.600_2.000 over_2.000 invalid	Rel 33 GLAS Binary Data	DS_UTCTime_1
MRC_af_flg	INTEGER_1 (UNLIMITED)	Medium Resolution Cloud Availability Flag (NOT_SET)	NOT_SET	Indicates number of cloud layers at medium resolution from the 532 nm channel; not_searched = cloud layers were not searched for; not_detected = cloud layers were searched for, but not detected. flag_values: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 | flag_meanings: not_searched 1 2 3 4 5 6 7 8 9 10 11 12 13 14 not_detected	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_Surface_temp	DOUBLE (UNLIMITED)	Surface Temperature (surface_temperature)	degree Celsius	Atmospheric temperature at Earth's surface level measured in degrees celcius and derived from the meteorological data files.	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_Surface_pres	DOUBLE (UNLIMITED)	Surface Pressure (surface_air_pressure)	hPa	Atmospheric pressure at Earth's surface level measured in hPa and derived from the meteorological data files.	Rel 33 GLAS Binary Data	DS_UTCTime_1
d_Surface_relh	DOUBLE (UNLIMITED)	Relative Humidity (relative_humidity)	percent	Atmospheric relative humidity at Earth's surface level measured as a percentage and derived from the meteorological data files.	Rel 33 GLAS Binary	DS_UTCTime_1

					Data	

Group: /Data_40HZ/

This group contains data with a rate of 40HZ. 40Hz data may be indexed to the 1HZ data using the i_rec_ndx parameter in each respective time group.

Dimension Scales

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
DS_UTCTime_40	DOUBLE (UNLIMITED)	Transmit time of each shot in J2000 seconds (time)	seconds since 2000-01-01 12:00:00 UTC	The transmit time of each shot in the 1 second frame measured as UTC seconds elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds.	Rel 33 GLAS Binary Data	NOT_SET
DS_DEMhiresArElv	INTEGER (UNLIMITED)	Location index for D_DEMhiresArElv (NOT_SET)	NOT_SET	This array indicates the relative position of each d_DEMhiresArElv measurement. Direction is relative to the spot and indicated in cardinal points. The position of the spot is indicated as ORIGIN. flag_values: 1, 2, 3, 4, 5, 6, 7, 8, 9 flag_meanings: NW N NE W ORIGIN E SW S SE	Constants	NOT_SET

Group: Data_40HZ/Time

This group contains the 40HZ index and time-related parameters

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
i_rec_ndx	INTEGER (UNLIMITED)	GLAS Record Index (NOT_SET)	NOT_SET	Unique index that relates this record to the corresponding record(s) in each GLAS data product.	Rel 33 GLAS Binary Data	DS_UTCTime_40
i_shot_count	INTEGER (UNLIMITED)	GLAS Pulse Index (NOT_SET)	NOT_SET	Identifies each laser shot within a record index. A combination of i_rec_ndx and i_shot_count can be used to uniquely identify each GLAS laser shot.	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Geolocation

This group contains geolocation-related parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_lat	DOUBLE (UNLIMITED)	Spot 1 Coordinate Data, Latitude Corrected (latitude)	degrees_north	The geodetic latitude of the laser spot computed from the precision orbit, precision attitude, and ice-sheet specific range after instrument corrections, atmospheric delays and tides have been applied. The values are in degrees north.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_lon	DOUBLE (UNLIMITED)	Spot 1 Coordinate Data, Longitude Corrected (longitude)	degrees_east	The longitude of the laser spot computed from the Precision orbit, precision attitude, and ice-sheet specific range after instrument corrections, atmospheric delays and tides have been applied. The values are in degrees east.	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Elevation_Surfaces

This group contains surface-related parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_elev	DOUBLE (UNLIMITED)	Surface Elevation (height_above_reference_ellipsoid)	meters	Surface elevation with respect to the ellipsoid at the spot location determined by the ice-sheet specific range after instrument corrections, atmospheric delays and tides have been applied. The saturation elevation correction (d_satElevCorr) has not been applied and needs to be added to this elevation. This can be over a one meter correction. If it is invalid then the elevation should not be used. The saturation correction flag (sat_corr_flg) is an important flag to understand the possible quality of the elevation data. The saturation index (i_satNdx) can be used for more understanding of concerns on data quality from saturation effects. Also no correction for pulse spreading from forward scatter has been applied.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_refRng	DOUBLE (UNLIMITED)	Reference Range (altimeter_range)	meters	Range in distance calculated from the time between the centroid of the transmit pulse and the farthest gate from the spacecraft of the received pulse. See the rngcorrflg to determine any corrections that have been applied.	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Elevation_Corrections

This group contains elevation-related corrections.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_dTrop	DOUBLE (UNLIMITED)	Range Correction, Dry Troposphere (altimeter_range_correction_due_to_dry_troposphere)	meters	The range correction due to the dry troposphere. Validity is based on results of finding a range with the standard fit.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_satElevCorr	DOUBLE (UNLIMITED)	Saturation Elevation Correction (NOT_SET)	meters	Correction to elevation for saturated waveforms. This correction has NOT been applied to the data. To apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_wTrop	DOUBLE (UNLIMITED)	Range Correction_Wet Troposphere (altimeter_range_correction_due_to_wet_troposphere)	meters	The range correction due to the wet troposphere. (See ATBDs)	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Elevation_Angles

This group contains pointing angle parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_beamCoelv	DOUBLE (UNLIMITED)	Co-elevation (NOT_SET)	degrees	Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_beamAzimuth	DOUBLE (UNLIMITED)	Azimuth (NOT_SET)	degrees	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.	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Elevation_Offsets

The group contains elevation offsets. These offsets allow the elevation for the specific surface types to be derived.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_SigBegOff	DOUBLE (UNLIMITED)	Signal Begin Range Offset (NOT_SET)	meters	Offset to be added to d_refRng to give the range in distance to the location of the received echo calculated at the beginning of signal (closest to the spacecraft) using standard parameters.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_TrshRngOff	DOUBLE (UNLIMITED)	Threshold Retracker Range Offset (NOT_SET)	meters	Offset to be added to d_refRng to give the range in distance to the threshold retracker location of the received echo using standard parameters.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_SigEndOff	DOUBLE (UNLIMITED)	Signal End Range Offset (NOT_SET)	meters	Offset to be added to d_refRng to give the range in distance to the location on the received echo calculated at the end of signal (farthest from the spacecraft) using standard parameters.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_cntRngOff	DOUBLE (UNLIMITED)	Centroid Range Offset (NOT_SET)	meters	Offset to be added to d_refRng to give the range in distance to the location of the centroid of the received echo from signal begin through signal end defined by the standard parameters.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_isRngOff	DOUBLE (UNLIMITED)	Ice Sheet Range Offset (NOT_SET)	meters	Range offset to be added to d_refRng to calculate the range using the algorithm deemed appropriate for ice sheets.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_siRngOff	DOUBLE (UNLIMITED)	Sea Ice Range Offset (NOT_SET)	meters	Range offset to be added to d_refRng to calculate the range using the algorithm deemed appropriate for sea ice.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_ldRngOff	DOUBLE (UNLIMITED)	Land Range Offset (NOT_SET)	meters	Range offset to be added to d_refRng to calculate the range using the algorithm deemed appropriate for land.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_ocRngOff	DOUBLE (UNLIMITED)	Ocean Range Offset (NOT_SET)	meters	Range offset to be added to d_refRng to calculate the range using the algorithm deemed appropriate for oceans.	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Quality

This group contains data quality flags and related parameters.

Label	Datatype	long_name	units	description	source	coordinates

	(Dimensions)	(standard_name)				
rng_uqf_sigbeg1_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Signal begin range increment flag (standard) flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_sigend1_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Signal end range increment flag, (standard) flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_thres1_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Threshold retracker range increment flag (standard). flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_cent1_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Centroid retracker range increment flag (standard). flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_sigbeg2_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Signal begin range increment flag (alternate) flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_sigend2_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Signal end range increment flag (alternate) flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_thres2_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Threshold retracker range increment flag (alternate) flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_cent2_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Centroid retracker range increment flag (alternate) flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_is_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Ice sheet range increment flag flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_si_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Sea ice range increment flag flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_ld_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Land range increment flag flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
rng_uqf_oc_flg	INTEGER_1 (UNLIMITED)	Range Offset Quality/Use Flag (NOT_SET)	NOT_SET	Ocean range increment flag flag_values: 0, 1 flag_meanings: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
sat_corr_flg	INTEGER_1 (UNLIMITED)	Saturation Correction Flag (NOT_SET)	NOT_SET	Saturation Correction Flag; Indicates if the saturation is Not Saturated (i_satNdx<2) or No Signal; Inconsequential (i_satNdx>=2 & i_pctSat<2.0); is Applicable (i_satNdx>=2 & i_pctSat>=2.0 & Full Width*<100ns); is Not Computable; is Not Applicable (i_satNdx>=2 & i_pctSat>=2.0 & Full Width*>=100ns) flag_values: 0, 1, 2, 3, 4, 5 flag_meanings: not_saturated	Rel 33 GLAS Binary Data	DS_UTCTime_40

				inconsequential applicable not_computed not_applicable		
elev_use_flg	INTEGER_1 (UNLIMITED)	Elevation use flag (NOT_SET)	NOT_SET	Flag indicating whether the elevations on this record should be used. **flag_values**: 0, 1 **flag_meanings**: valid not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
att_pad_use_flg	INTEGER_1 (UNLIMITED)	Pad Use Flag (NOT_SET)	NOT_SET	PAD Use Flag: 1 = PAD used to determine spot location. **flag_values**: 0, 1 **flag_meanings**: used not_used	Rel 33 GLAS Binary Data	DS_UTCTime_40
att_calc_pad_flg	INTEGER_1 (UNLIMITED)	Calc Pad Use Flag (NOT_SET)	NOT_SET	Calc PAD Use Flag; Indicates if new PAD or pass-thru PAD was used to determine orbit. **flag_values**: 0, 1 **flag_meanings**: new pass_thru	Rel 33 GLAS Binary Data	DS_UTCTime_40
att_lpa_flg	INTEGER_1 (UNLIMITED)	LPA Problem Flag (NOT_SET)	NOT_SET	LPA Problem Flag; Indicates if LPA is good, missing or noisy. **flag_values**: 0, 1, 2 **flag_meanings**: good missing noisy	Rel 33 GLAS Binary Data	DS_UTCTime_40
sigma_att_flg	INTEGER_1 (UNLIMITED)	Attitude Quality Indicator (NOT_SET)	NOT_SET	Attitude quality indicator flag. **flag_values**: 0, 50, 100, 127 **flag_meanings**: good warning bad not_valid	Rel 33 GLAS Binary Data	DS_UTCTime_40
i_satNdx	INTEGER (UNLIMITED)	Saturation Index (NOT_SET)	ns	The count of the number of gates in a waveform which have an amplitude greater than or equal to i_satNdxTh (set in anc07_0004). The value 126 means 126 or more gates are above the saturation index threshold (i_satNdxth).	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_pctSAT	DOUBLE (UNLIMITED)	Percent Saturation (NOT_SET)	percent	Percent saturation (d_pctSAT) is calculated using the formula: d_pctSAT= 100*(saturation index)/ (signal end - signal begin in nanoseconds). The alternate signal end/begin are used for GLA14 d_pctSAT, while the standard fit values are used for GLA06, 12, 13, and 15. The Saturation elevation correction is not applied in the geolocation processing computation of lat, lon and elev. Because the saturation corrections are small and data is acquired within 5 deg off nadir, effects on lat and lon can be ignored. To apply the saturation elevation correction to the elevations on the products it must be ADDED to the elevation estimates. Reported elevations for returns with invalid d_satElevCorr values and sat_corr_flg values of 3 or 4 are likely to have large, uncorrectable errors and should be excluded from analyses.	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Elevation_Flags

This group contains flags related to the elevation estimates for each shot.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
elv_cnt_1_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Standard parameterization; 1 = centroid of received pulse between signal begin and signal end defined for standard parameterization used to calculate elevation. **flag_values**: 0, 1 **flag_meanings**: false true	Rel 33 GLAS Binary Data	DS_UTCTime_40
elv_cnt_2_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Alternate parameterization; 1 = centroid of received pulse between signal begin and signal end defined for alternate parameterization used to calculate elevation. **flag_values**: 0, 1 **flag_meanings**: false true	Rel 33 GLAS Binary Data	DS_UTCTime_40
elv_peak_1_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Standard parameterization; 1 = location of last Gaussian peak in received pulse for standard parameterization used to calculate elevation.	Rel 33 GLAS Binary Data	DS_UTCTime_40

				flag_values: 0, 1 / flag_meanings: false true		
elv_peak_2_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Alternate parameterization; 1 = location of last gaussian peak in received pulse for alternate parameterization used to calculate elevation. flag_values: 0, 1 / flag_meanings: false true	Rel 33 GLAS Binary Data	DS_UTCTime_40
elv_thres_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Threshold retracker; 1 = Location of threshold retracker used to calculate elevation. flag_values: 0, 1 / flag_meanings: false true	Rel 33 GLAS Binary Data	DS_UTCTime_40
elv_gauss_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Gaussion; 1 = location associated with gaussian with largest peak used to calculate elevation. flag_values: 0, 1 / flag_meanings: false true	Rel 33 GLAS Binary Data	DS_UTCTime_40
elv_other_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Other algorithm; 1 = other algorithm used to calculate elevation - see software release documentation for details. flag_values: 0, 1 / flag_meanings: false true	Rel 33 GLAS Binary Data	DS_UTCTime_40
elv_cloud_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Cloud contamination; 1 = Gain > flag value, indicating probable cloud contamination flag_values: 0, 1 / flag_meanings: false true	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Transmit_Energy

This group contains transmit energy parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_TxNrg	DOUBLE (UNLIMITED)	1064 nm Laser Transmit Energy (NOT_SET)	joules	The 1064 nm laser pulse transmitted energy in energy units, computed from the digitized outgoing pulse, and the transmit gain.	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Geophysical

This group contains geophysical parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_d2refTrk	DOUBLE (UNLIMITED)	Distance to the reference ground track (NOT_SET)	meters	Distance to the reference ground track.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_DEM_elv	DOUBLE (UNLIMITED)	DEM Elevation (NOT_SET)	meters	Elevation at the footprint location from the SRTM30 (GTOPO30 + SRTM) Digital Elevation Model (DEM). The reference frame for the DEM elevation was changed to the TOPEX/Poseidon ellipsoid to make it consistent with the GLAS elevations.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_DEMhiresArElv	DOUBLE (UNLIMITED, 9)	DEMhiresArElv (NOT_SET)	meters	d_DEMhiresArElv is a 9 element array of high resolution DEM values. The array index corresponds to the position of the DEM value relative to the spot. (5) is the footprint center.	Rel 33 GLAS Binary Data	DS_UTCTime_40, d_DEMhiresArElv
d_ocElv	DOUBLE (UNLIMITED)	Ocean Tide Elevation (sea_surface_height_amplitude_due_to_non_equilibrium_ocean_tide)	meters	The ocean tide elevation from the TPX07.1 tide model.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_poTide	DOUBLE (UNLIMITED)	Pole Tide (sea_surface_height_amplitude_due_to_pole_tide)	meters	Pole tide: an ocean tide which is the result of the Chandler wobble (a free nutation of the Earth caused by fluctuating pressure on the bottom of the ocean, caused by temperature and salinity changes and wind-driven	Rel 33 GLAS Binary Data	DS_UTCTime_40

				changes in the circulation of the oceans).		
d_gdHt	DOUBLE (UNLIMITED)	Geoid (geoid_height_above_reference_ellipsoid)	meters	The height of the geoid above the ellipsoid. EGM2008 geoid height above the reference ellipsoid.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_erElv	DOUBLE (UNLIMITED)	Solid Earth Tide Elevation (geoid_height_above_reference_ellipsoid)	meters	The solid earth tide elevation.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_eqElv	DOUBLE (UNLIMITED)	Equilibrium Tide Elevation (sea_surface_height_amplitude_due_to_equilibrium_ocean_tide)	meters	The equilibrium (long period) tide at last valid shot over the ocean.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_ldElv	DOUBLE (UNLIMITED)	Load Tide Elevation (NOT_SET)	meters	The load tide elevation applied to each shot.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_deltaEllip	DOUBLE (UNLIMITED)	Delta Ellipsoid (NOT_SET)	meters	Surface elevation(T/P ellipsoid) minus surface elevation (WGS84 ellipsoid).	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_ElevBiasCorr	DOUBLE (UNLIMITED)	Elevation Bias Correction (NOT_SET)	meters	Correction to elevation based on post flight analysis for biases determined for each campaign. This bias correction has not been applied to the data. To apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.	Rel 33 GLAS Binary Data	DS_UTCTime_40
i_DEM_hires_src_1	INTEGER_1 (UNLIMITED)	High Resolution Source Flag (NOT_SET)	NOT_SET	High resolution DEM source provider; Indicates if no high res source available, unfinished research Shuttle Radar Topography Mission (SRTM) C-band 90m DEM produced by JPL (+-1.1km E-W swath), finished' SRTM C-band 90 m DEM produced by NGA (+-2.1km E-W swath), ICESat Greenland V1 1km DEM, ICESat Antarctica V1 500m DEM, 90m Canadian Digital Elevation Data (CDED), 90m Canadian Digital Elevation Data (CDED) if available otherwise finished SRTM C-band 90 m DEM. **flag_values**: 0, 1, 2, 3, 4, 5, 6 — **flag_meanings**: none pre_srtm srtm greenland antarctica cded_90 cded_srtm	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Reflectivity

This group contains reflectivity parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_reflctUC	DOUBLE (UNLIMITED)	reflctUC (NOT_SET)	NOT_SET	Reflectivity, not corrected for atmospheric effects, is calculated as Refl = R/T, where R is the received energy after it has been scaled for range, and T is the transmitted energy. i_reflctUC has also been calibrated for gain non-linearity (only for non-saturated waveforms), ground truth calibration and boresight shift shadowing (BSS). It is not corrected for saturation effects. If the shot is saturated (satindex above 2) then to correct for saturation the reflectivity estimate needs to be multiplied by the ratio of the corrected energy to the uncorrected energy (sat corrected reflectivity = d_reflctUC * (d_RecNrgAll + d_satNrgCorr)/d_RecNrgAll). The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by d_reflCor_atm. d_reflctUC is invalid where d_satNrgCorr is invalid.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_sDevNsOb1	DOUBLE (UNLIMITED)	Standard deviation of 1064 nm Background noise, (alternate) (NOT_SET)	volts	The standard deviation of the background noise (alternate parameters).	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_satNrgCorr	DOUBLE (UNLIMITED)	Saturation Energy Correction (NOT_SET)	joules	Correction to energy for saturated waveforms. This correction has not been applied to the energy. It should be ADDED to any echo pulse energy calculated from the pulse area under the waveform. Also any reflectivity estimates need to be corrected for this error in energy	Rel 33 GLAS Binary Data	DS_UTCTime_40

				measurement.		
d_RecNrgAll	DOUBLE (UNLIMITED)	Received Energy signal begin to signal end (NOT_SET)	joules	This is calculated by taking the area under the received waveform (referenced to the observed noise) from all responses between the noise crossing before the first threshold crossing and the noise crossing after the last threshold crossing. It is a rescaled value from the GLA01 parameter d_recNrgAll_EU and is not recomputed.	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Waveform

This group contains waveform-related parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_skew2	DOUBLE (UNLIMITED)	Skewness (NOT_SET)	NOT_SET	The skewness of the received echo from signal begin to signal end using standard parameters.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_kurt2	DOUBLE (UNLIMITED)	Kurtosis of the Received Echo (standard) (NOT_SET)	NOT_SET	Kurtosis of the received echo from signal begin to signal end using standard parameters	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_maxRecAmp	DOUBLE (UNLIMITED)	Max Amplitude of Received Echo (NOT_SET)	volts	Maximum amplitude of the received echo.	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_maxSmAmp	DOUBLE (UNLIMITED)	Peak Amplitude of Smoothed Received Echo (NOT_SET)	volts	The peak amplitude of the received echo after it has been smoothed to remove high frequency noise (see ATBD).	Rel 33 GLAS Binary Data	DS_UTCTime_40
i_nPeaks1	INTEGER (UNLIMITED)	Initial Number of Peaks in received echo (alternate) (NOT_SET)	NOT_SET	The initial number of peaks of the received echo; determined from the smoothed waveform, using alternate parameters.	Rel 33 GLAS Binary Data	DS_UTCTime_40
i_numPk	INTEGER (UNLIMITED)	Number of Peaks found in the Return (NOT_SET)	NOT_SET	The number of peaks in the return echo found by the gaussian fitting procedure, using standard parameters.	Rel 33 GLAS Binary Data	DS_UTCTime_40
i_gval_rcv	INTEGER (UNLIMITED)	Gain Value used for Received Pulse (NOT_SET)	NOT_SET	Gain value used for received pulse - uncalibrated.	Rel 33 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Atmosphere

This group contains atmosphere-related parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_FRir_cldtop	DOUBLE (UNLIMITED)	Full Resolution 1064 Cloud Top (NOT_SET)	meters	Full resolution (40 Hz) cloud top height obtained from the 1064 atmospheric channel. This parameter is in GLA09.	Rel 33 GLAS Binary Data	DS_UTCTime_40
FRir_qa_flg	INTEGER_1 (UNLIMITED)	Full Resolution 1064 Quality Flag (NOT_SET)	NOT_SET	Full resolution 1064 Quality Flag; 0 - 12 indicate Cloud detected by cloud search algorithm with higher numbers indicating a stronger average signal from the region starting at cloud top and extending 500 m below cloud top height; 13 = Indicates the possible presence of a cloud based on the value of the integrated signal parameter (i_FRir_intsig) that was not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 10.0 km; 14 = Indicates the likely presence of low clouds (< 150 m) based on elevated signal from the two bins above the ground return bin that were not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 0.10; 15 = No clouds **flag_values**: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 **flag_meanings**: 0 1 2 3 4 5 6 7 8 9 10 11 12 possible likely no_clouds	Rel 33 GLAS Binary Data	DS_UTCTime_40
d_FRir_intsig	DOUBLE (UNLIMITED)	Full Resolution 1064 Integrated Signal (NOT_SET)	1/(m-sr)	Though called 'integrated signal' this is actually an average of all bins in the above-ground portion of the 1064 40 Hz profile with values above the threshold of 1.0e-7 (1/(m-sr) units). This parameter is for a 1 second record. This parameter is extracted from the equivalent parameter on GLA09.	Rel 33 GLAS Binary Data	DS_UTCTime_40

/ANCILLARY_DATA

/ANCILLARY_DATA

Attribute	Example Value
Campaign	3J
glas_osc_rate	1.00000002934
glas_osc_rate_date	2008-02-13
glas_osc_rate_time	22:27:27
sc_osc_rate	0.99999998854809
sc_osc_rate_date	2008-02-13
sc_osc_rate_time	22:27:27
internal_time_delay	0.0000151100
internal_time_delay_date	2008-02-13
internal_time_delay_time	22:27:27
internal_range_delay	9.5560
internal_range_delay_date	2008-02-13
internal_range_delay_time	22:27:27
Additional_Attribute	SP_ICE_PATH_NO, SP_ICE_GLAS_StartBlock, SP_ICE_GLAS_EndBlock, ReferenceOrbit, Track, Track_Segment, Cycle, Instance, Range_Bias, Range_Bias_Date, Range_Bias_Time, Timing_Bias, Timing_Bias_Date, Timing_Bias_Time, PercentGroundHit, OrbitQuality
globAvSrfPres1	100918.3941886
gASP_t1	257774400.0000000
globAvSrfPres2	96785.3311111
gASP_t2	257796000.0000000
internal_range_delay_desc	Internal range calibration bias determined during GLAS instrument integration testing and validated in-flight, meters.
internal_time_delay_desc	Internal time calibration bias determined during GLAS instrument integration testing and validated in-flight, seconds.

/METADATA

/METADATA

Attribute	Example Value
description	This group contains structured, computer-parseable ECHO-style collection and inventory-level metadata.
HDFVersion	HDF5 1.8.9
ControlFile	cf_name=gla06_test_1.ctl

/METADATA/COLLECTIONMETADATA

Attribute	Example Value
DLLName	libDsESDTGlGLASPoly.001Sh.so
GranuleTimeDuration	1620
SpatialSearchType	Orbit
DataFileFormat	HDF5
ScienceMimeType	application/x-hdfeos
BrowseMimeType	application/x-hdfeos
BrowseOnlineMimeType	image/jpeg
ShortName	GLAH06
LongName	GLAS/ICESat L1B Global Elevation Data (HDF5)
CollectionDescription	Data granules contain approximately 23 minutes (1/4 orbit) and include the surface elevation, surface roughness assuming no slope, surface slope assuming no roughness and geodetic and atmospheric corrections for the range at the full 40/sec resolution.
VersionID	33
CitationforExternalPublication	The data used in this study were produced by the GLAS Science Team at the ICESat Science Investigator-led Processing System (I-SIPS) at NASA/GSFC. The data archive site is the NSIDC DAAC.
CollectionState	In Work
MaintenanceandUpdateFrequency	Daily
AccessConstraints	Data may not be reproduced or distributed without including the CitationForExternalPublication for this product included in this Metadata. Data may not be distributed in an altered form without the written permission of the GLAS Science Team.
TemporalKeyword	Day
SpatialKeyword	Global

/METADATA/COLLECTIONMETADATA/AdditionalAttributes

Attribute	Example Value
PercentGroundHit	AdditionalAttributesContainer
OrbitQuality	AdditionalAttributesContainer
Track	AdditionalAttributesContainer
Track_Segment	AdditionalAttributesContainer
Instrument_State	AdditionalAttributesContainer
ReferenceOrbit	AdditionalAttributesContainer
Cycle	AdditionalAttributesContainer
SP_ICE_PATH_NO	AdditionalAttributesContainer
SP_ICE_GLAS_StartBlock	AdditionalAttributesContainer
SP_ICE_GLAS_EndBlock	AdditionalAttributesContainer
Instance	AdditionalAttributesContainer
Range_Bias	AdditionalAttributesContainer
Instrument_State_Date	AdditionalAttributesContainer
Instrument_State_Time	AdditionalAttributesContainer
Range_Bias_Date	AdditionalAttributesContainer
Range_Bias_Time	AdditionalAttributesContainer
Timing_Bias	AdditionalAttributesContainer
Timing_Bias_Date	AdditionalAttributesContainer
Timing_Bias_Time	AdditionalAttributesContainer
Timing_Drift	AdditionalAttributesContainer
Timing_Drift_Date	AdditionalAttributesContainer
Timing_Drift_Time	AdditionalAttributesContainer
identifier_product_doi	AdditionalAttributesContainer
identifier_file_uuid	AdditionalAttributesContainer
identifier_product_doi_authority	AdditionalAttributesContainer

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Cycle

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	A count of the number of exact repeats of this reference orbit.
AdditionalAttributeName	Cycle
ParameterUnitsofMeasurement	counts
ParameterRangeBegin	0
ParameterRangeEnd	250

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Instance

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	The number of times that we have returned to a specific reference orbit.
AdditionalAttributeName	Instance
ParameterUnitsofMeasurement	counts
ParameterRangeBegin	1
ParameterRangeEnd	99

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Instrument_State

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	Flag word that indicates which redundant units (laser, detector, oscillator) of the GLAS instrument are in operation.
AdditionalAttributeName	Instrument_State
ParameterUnitsofMeasurement	Flag word
ParameterRangeBegin	0
ParameterRangeEnd	5

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Instrument_State_Date

Attribute	Example Value
AdditionalAttributeDatatype	date
AdditionalAttributeDescription	The date that corresponds to the first valid Instrument_State. There is a maximum of two per granule.
AdditionalAttributeName	Instrument_State_Date

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Instrument_State_Time

Attribute	Example Value
AdditionalAttributeDatatype	time
AdditionalAttributeDescription	The time that corresponds to the first valid Instrument_State. There is a maximum of two per granule.
AdditionalAttributeName	Instrument_State_Time

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/OrbitQuality

Attribute	Example Value
AdditionalAttributeDatatype	varchar
AdditionalAttributeDescription	Status word that states what type of orbit was used during processing of the data for the granule. It specifies the models used in the orbit determination program. This provides an indication of the quality of the orbits being applied to the data.
AdditionalAttributeName	OrbitQuality
ParameterUnitsofMeasurement	Flag

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/PercentGroundHit

Attribute	Example Value
AdditionalAttributeDatatype	float
AdditionalAttributeDescription	Percent of data for this granule that had a detected ground return of the transmitted laser pulse.
AdditionalAttributeName	PercentGroundHit
ParameterUnitsofMeasurement	Percent
ParameterRangeBegin	0.0
ParameterRangeEnd	100.0
ParameterValueAccuracy	1
ParameterMeasurementResolution	1

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Range_Bias

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	The additive calibration correction in millimeters to apply to range based on the science team cal/val activities.
AdditionalAttributeName	Range_Bias
ParameterUnitsofMeasurement	Millimeters
ParameterRangeBegin	-10000
ParameterRangeEnd	10000
ParameterValueAccuracy	1
ParameterMeasurementResolution	1

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Range_Bias_Date

Attribute	Example Value
AdditionalAttributeDatatype	date
AdditionalAttributeDescription	The date that corresponds to the first valid Range_Bias. There are a maximum of two per granule.
AdditionalAttributeName	Range_Bias_Date

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Range_Bias_Time

Attribute	Example Value
AdditionalAttributeDatatype	time
AdditionalAttributeDescription	The time that corresponds to the first valid Range_Bias. There are a maximum of two per granule.
AdditionalAttributeName	Range_Bias_Time

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/ReferenceOrbit

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	Assigned number for which exact orbital elements describe the exact repeat orbit pattern.
AdditionalAttributeName	ReferenceOrbit
ParameterUnitsofMeasurement	Assigned number
ParameterRangeBegin	1
ParameterRangeEnd	30000

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/SP_ICE_GLAS_EndBlock

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	Integer number within GLAS coverage scheme in which granule data ends.
AdditionalAttributeName	SP_ICE_GLAS_EndBlock
ParameterRangeBegin	1
ParameterRangeEnd	360

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/SP_ICE_GLAS_StartBlock

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	Integer number within GLAS coverage scheme in which granule data starts.
AdditionalAttributeName	SP_ICE_GLAS_StartBlock
ParameterRangeBegin	1
ParameterRangeEnd	360

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/SP_ICE_PATH_NO

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	Number which represents the GLAS path number.
AdditionalAttributeName	SP_ICE_PATH_NO
ParameterRangeBegin	1
ParameterRangeEnd	32768

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Timing_Bias

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	The time tag error determined by the calibration team that was added to the time tags to compute the true time of data as provided on the granule.
AdditionalAttributeName	Timing_Bias
ParameterUnitsofMeasurement	Microseconds
ParameterRangeBegin	-1000000
ParameterRangeEnd	+1000000

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Timing_Bias_Date

Attribute	Example Value
AdditionalAttributeDatatype	date
AdditionalAttributeDescription	The date that corresponds to the first valid Timing_Bias. There are a maximum of two per granule.
AdditionalAttributeName	Timing_Bias_Date

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Timing_Bias_Time

Attribute	Example Value
AdditionalAttributeDatatype	time
AdditionalAttributeDescription	The time that corresponds to the first valid Timing_Bias. There are a maximum of two per granule.
AdditionalAttributeName	Timing_Bias_Time

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Timing_Drift

Attribute	Example Value
AdditionalAttributeDatatype	float
AdditionalAttributeDescription	This is the ratio of the true time for a one second oscilator tick to nominal one
AdditionalAttributeName	Timing_Drift
ParameterRangeBegin	-1.0
ParameterRangeEnd	+1.0

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Timing_Drift_Date

Attribute	Example Value
AdditionalAttributeDatatype	date
AdditionalAttributeDescription	The date that corresponds to the first valid Timing_Drift. There are a maximum of two per granule.
AdditionalAttributeName	Timing_Drift_Date

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Timing_Drift_Time

Attribute	Example Value
AdditionalAttributeDatatype	time
AdditionalAttributeDescription	The time that corresponds to the first valid Timing_Drift. There are a maximum of two per granule.
AdditionalAttributeName	Timing_Drift_Time

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Track

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	The unique number assigned for each repeat ground track (one orbit) of the reference orbit.
AdditionalAttributeName	Track
ParameterUnitsofMeasurement	counts
ParameterRangeBegin	0
ParameterRangeEnd	3000

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/Track_Segment

Attribute	Example Value
AdditionalAttributeDatatype	int
AdditionalAttributeDescription	Number assigned for the specific latitude segment (1 = +50 to +50, 2 = +50 to -50, 3 = -50 to -50, 4 = -50 to +50) of the track for the data.
AdditionalAttributeName	Track_Segment
ParameterUnitsofMeasurement	counts
ParameterRangeBegin	1
ParameterRangeEnd	4

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/identifier_file_uuid

Attribute	Example Value
AdditionalAttributeDatatype	varchar
AdditionalAttributeDescription	Universally unique identifier for this data product's files
AdditionalAttributeName	identifier_file_uuid

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/identifier_product_doi

Attribute	Example Value
AdditionalAttributeDatatype	varchar
AdditionalAttributeDescription	Digital object identifier that uniquely identifies this data product
AdditionalAttributeName	identifier_product_doi

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/identifier_product_doi/InformationContent

Attribute	Example Value
ParameterValue	10.5067/ICESAT/GLAS/DATA106

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/identifier_product_doi_authority

Attribute	Example Value
AdditionalAttributeDatatype	varchar
AdditionalAttributeDescription	URL of the digital object identifier resolving authority
AdditionalAttributeName	identifier_product_doi_authority

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/identifier_product_doi_authority/InformationContent

Attribute	Example Value
ParameterValue	http://dx.doi.org

/METADATA/COLLECTIONMETADATA/CSDTDescription

Attribute	Example Value
PrimaryCSDT	n-Dim Array of Records
IndirectReference	tracks/orbits
Implementation	HDF
CSDTComments	Data for each orbit is divided into four granules. Lat +50 to +50, Lat +50 to -50, Lat -50 to -50, Lat -50 to +50.

/METADATA/COLLECTIONMETADATA/CollectionAssociation

Attribute	Example Value
GLAH05	CollectionAssociationContainer
GLAH01	CollectionAssociationContainer
GLA00	CollectionAssociationContainer
GLAH12	CollectionAssociationContainer
GLAH13	CollectionAssociationContainer
GLAH14	CollectionAssociationContainer
GLAH15	CollectionAssociationContainer

/METADATA/COLLECTIONMETADATA/CollectionAssociation/GLA00

Attribute	Example Value
CollectionType	Science Associated
CollectionUse	The initial collection of GLAS instrument data downlinked from the spacecraft
ShortName	GLA00
VersionID	1

/METADATA/COLLECTIONMETADATA/CollectionAssociation/GLAH01

Attribute	Example Value
CollectionType	Science Associated
CollectionUse	Level 1A file containing: altimeter height, waveform data, and other data required to produce the Level 1B waveform products.
ShortName	GLAH01
VersionID	33

/METADATA/COLLECTIONMETADATA/CollectionAssociation/GLAH05

Attribute	Example Value
CollectionType	Input
CollectionUse	Level 1B file containing: the range, corrections to the range from the waveform retracking algorithms, the surface roughness estimate, and the reflectance. GLAH05 provides the range corrections and waveform analysis results needed to compute the elevation.
ShortName	GLAH05
VersionID	33

/METADATA/COLLECTIONMETADATA/CollectionAssociation/GLAH12

Attribute	Example Value
CollectionType	Dependent
CollectionUse	Level 2 file containing: corrected ice sheet elevations above the reference ellipsoid, surface roughness, reflectance, and the

	corrections that were used. The product parameters are the result of product-specialized waveform fitting.
ShortName	GLAH12
VersionID	33

/METADATA/COLLECTIONMETADATA/CollectionAssociation/GLAH13

Attribute	Example Value
CollectionType	Dependent
CollectionUse	Level 2 file containing: Sea Ice Elevation, Reflectancce, and Roughness, Ice Berg Elevations and Roughness. The product parameters are the result of product-specialized waveform fitting.
ShortName	GLAH13
VersionID	33

/METADATA/COLLECTIONMETADATA/CollectionAssociation/GLAH14

Attribute	Example Value
CollectionType	Dependent
CollectionUse	Level 2 file containing: corrected surface elevations above the reference ellipsoid, surface roughness, reflectance, and the corrections that were used. The product parameters are the result of product-specialized waveform fitting.
ShortName	GLAH14
VersionID	33

/METADATA/COLLECTIONMETADATA/CollectionAssociation/GLAH15

Attribute	Example Value
CollectionType	Dependent
CollectionUse	Level 2 file containing: corrected Ocean elevations above the reference ellipsoid, surface roughness, reflectance, and the corrections that were used. The product parameters are the result of product-specialized waveform fitting.
ShortName	GLAH15
VersionID	33

/METADATA/COLLECTIONMETADATA/ContactOrganization

Attribute	Example Value
Data_Originator	ContactOrganizationContainer
Archive	ContactOrganizationContainer

/METADATA/COLLECTIONMETADATA/ContactOrganization/Archive

Attribute	Example Value
Role	Archive
HoursofService	M-F, 8:00am to 5:00pm, Mountain Time
ContactInstructions	For inquiries, contact NSIDC User Services. Primary first level contact.
ContactOrganizationName	NSIDC User Services
StreetAddress	CIRES/NSIDC University of Colorado Campus, Box 449
City	Boulder
StateProvince	Colorado
PostalCode	80309-0449
Country	USA
TelephoneNumber	303-492-2468
TelephoneNumberType	Facsimile
ElectronicMailAddress	nsidc@nsidc.org

/METADATA/COLLECTIONMETADATA/ContactOrganization/Data_Originator

Attribute	Example Value
Role	Data Originator
HoursofService	M-F, 8:00am to 4:30pm Eastern Time
ContactInstructions	Contact by e-mail first
ContactOrganizationName	ICESat Science Investigator-led Processing System (I-SIPS)
StreetAddress	Building 33, NASA Goddard Space Flight Center

City	Greenbelt
StateProvince	Maryland
PostalCode	20771
Country	USA
TelephoneNumber	757-864-1238
TelephoneNumberType	Voice
ElectronicMailAddress	David.W.Hancock@nasa.gov

/METADATA/COLLECTIONMETADATA/ContactPerson

Attribute	Example Value
Hancock	ContactPersonContainer
Schutz	ContactPersonContainer
Zwally	ContactPersonContainer
DiMarzio	ContactPersonContainer

/METADATA/COLLECTIONMETADATA/ContactPerson/DiMarzio

Attribute	Example Value
Role	Producer
HoursofService	M-F, 8:00am to 4:30pm Eastern Time
ContactInstructions	None
ContactJobPosition	Deputy Science Software Development Manager
ContactFirstName	John
ContactMiddleName	P
ContactLastName	DiMarzio
StreetAddress	Building 33, Rm. B-209D, NASA/GSFC
City	Greenbelt
StateProvince	Maryland
PostalCode	20771
Country	USA
TelephoneNumber	301-614-5893
TelephoneNumberType	Voice
ElectronicMailAddress	John.P.Dimarzio.1@nasa.gov

/METADATA/COLLECTIONMETADATA/ContactPerson/Hancock

Attribute	Example Value
Role	Data Originator
HoursofService	M-F, 8:00am to 4:30pm. Eastern Time.
ContactInstructions	None
ContactJobPosition	Science Software Development Manager.
ContactFirstName	David
ContactMiddleName	W.
ContactLastName	Hancock
StreetAddress	Building N-159, NASA/GSFC Wallops Flight Facility.
City	Wallops Island
StateProvince	Virginia
PostalCode	23337
Country	USA
TelephoneNumber	757-824-1238
TelephoneNumberType	Voice
ElectronicMailAddress	David.W.Hancock@nasa.gov

/METADATA/COLLECTIONMETADATA/ContactPerson/Schutz

Attribute	Example Value
Role	Investigator

HoursofService	M-F, 8:00am to 4:30pm Central Time
ContactInstructions	None
ContactJobPosition	GLAS Science Team Leader
ContactFirstName	Bob
ContactMiddleName	E
ContactLastName	Schutz
StreetAddress	3925 W. Braker Lane, Center for Space Research
City	Austin
StateProvince	Texas
PostalCode	78759-5321
Country	USA
TelephoneNumber	512-471-4267
TelephoneNumberType	Voice
ElectronicMailAddress	schutz@utcsr.ae.utexas.edu

/METADATA/COLLECTIONMETADATA/ContactPerson/Zwally

Attribute	Example Value
Role	Producer
HoursofService	M-F, 8:00am to 4:30pm Eastern Time
ContactInstructions	None.
ContactJobPosition	ICESat Project Scientist
ContactFirstName	Jay
ContactLastName	Zwally
StreetAddress	Building 33, Rm A-217
City	Greenbelt
StateProvince	Maryland
PostalCode	20771
Country	USA
TelephoneNumber	301-614-5643
TelephoneNumberType	Voice
ElectronicMailAddress	Jay.Zwally@nasa.gov

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters

Attribute	Example Value
Hydrosphere	DisciplineTopicParametersContainer
Land_Surface	DisciplineTopicParametersContainer
Cryosphere	DisciplineTopicParametersContainer
Oceans	DisciplineTopicParametersContainer

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters/Cryosphere

Attribute	Example Value
ECSDisciplineKeyword	Earth Science
ECSTopicKeyword	Cryosphere
ECSTermKeyword	Sea Ice
ECSVariableKeyword	Ice Roughness

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters/Cryosphere/ECSParameter

Attribute	Example Value
ECSParameterKeyword	Laser Reflectance

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters/Hydrosphere

Attribute	Example Value
ECSDisciplineKeyword	Earth Science

ECSTopicKeyword	Hydrosphere
ECSTermKeyword	Glaciers/Ice Sheets
ECSVariableKeyword	Glacier Elevation/Ice Sheet Elevation

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters/Land_Surface

Attribute	Example Value
ECSDisciplineKeyword	Earth Science
ECSTopicKeyword	Land Surface
ECSTermKeyword	Surface Radiative Properties
ECSVariableKeyword	Reflectance

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters/Land_Surface/ECSParameter

Attribute	Example Value
ECSParameterKeyword	Laser Reflectance

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters/Oceans

Attribute	Example Value
ECSDisciplineKeyword	Earth Science
ECSTopicKeyword	Oceans
ECSTermKeyword	Sea Surface Topography
ECSVariableKeyword	Sea Surface Height

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters/Oceans/ECSParameter

Attribute	Example Value
ECSParameterKeyword	Laser Reflectance

/METADATA/COLLECTIONMETADATA/ECSCollection

Attribute	Example Value
RevisionDate	2012-06-25
SuggestedUsage	Scientists investigating surface elevation, slope, reflection, and other surface characteristics can use the GLAH06 data. The data values were used in the creation of the surface-specific altimeter products (GLAH12-15). Each GLAH06 file was created from an equivalent GLA06 binary formatted file. Users that want to access the data used to create the GLAH06 values can use the equivalent GLAHxx files for the GLAxx files as shown in the provenance metadata for the history that created the GLA06.
ProcessingCenter	GSFC I-SIPS
ArchiveCenter	NSIDC
VersionDescription	Initial Version
DatasetDisclaimerPointer	http://nsidc.org/data/icesat/disclaimer.html
ECSCollectionGuidePointer	http://nsidc.org/data/docs/daac/glas_icesat_l1_l2_global_altimetry.gd.html
ECSCollectionGuidePointerComment	Guide Document for this product at NSIDC
MiscellaneousInformationPointer	http://nsidc.org/daac/icesat/index.html
MiscellaneousInformationPointerComment	GLAS Product page at NSIDC

/METADATA/COLLECTIONMETADATA/Platform

Attribute	Example Value
ICESat	PlatformContainer

/METADATA/COLLECTIONMETADATA/Platform/ICESat

Attribute	Example Value
PlatformShortName	ICESat
PlatformLongName	Ice, Cloud, and Land Elevation Satellite
PlatformType	Spacecraft

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument

Attribute	Example Value

GLAS	InstrumentContainer
GPS	InstrumentContainer

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS

Attribute	Example Value
InstrumentShortName	GLAS
InstrumentLongName	Geoscience Laser Altimeter System
InstrumentTechnique	Laser Altimetry and Light Detection and Radar
NumberofSensors	3

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/InstrumentCharacteristic

Attribute	Example Value
SwathWidth	InstrumentCharacteristicContainer

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/InstrumentCharacteristic/SwathWidth

Attribute	Example Value
InstrumentCharacteristicName	SwathWidth
InstrumentCharacteristicDescription	The width of the sensor scan as the satellite moves along the ground track.
InstrumentCharacteristicDataType	int
InstrumentCharacteristicUnit	kilometers
InstrumentCharacteristicValue	2

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor

Attribute	Example Value
LA	SensorContainer
PC	SensorContainer
CD	SensorContainer

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/CD

Attribute	Example Value
SensorShortName	CD
SensorLongName	Cloud LIDAR
SensorTechnique	Measure of 1064nm return energy in 75m bins from 20km to surface

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/CD/SensorCharacteristic

Attribute	Example Value
wavelength	SensorCharacteristicContainer

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/CD/SensorCharacteristic/wavelength

Attribute	Example Value
SensorCharacteristicName	wavelength
SensorCharacteristicDescription	detector
SensorCharacteristicDataType	varchar
SensorCharacteristicUnit	nanometer
SensorCharacteristicValue	1064 nm

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/LA

Attribute	Example Value
SensorShortName	LA
SensorLongName	Laser Altimeter
SensorTechnique	Exact Measurement of Time between Transmit Pulse and receive ground return

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/LA/SensorCharacteristic

Attribute	Example Value
wavelength	SensorCharacteristicContainer
waveform	SensorCharacteristicContainer

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/LA/SensorCharacteristic/waveform

Attribute	Example Value
SensorCharacteristicName	waveform
SensorCharacteristicDescription	digitizer
SensorCharacteristicDataType	varchar
SensorCharacteristicUnit	counts
SensorCharacteristicValue	0-255

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/LA/SensorCharacteristic/wavelength

Attribute	Example Value
SensorCharacteristicName	wavelength
SensorCharacteristicDescription	transmission
SensorCharacteristicDataType	varchar
SensorCharacteristicUnit	nanometer
SensorCharacteristicValue	1064 nm

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/PC

Attribute	Example Value
SensorShortName	PC
SensorLongName	Photon Counter for the 532 nm Aerosol Returns
SensorTechnique	Counting of 532nm photon return in 75m bins 40km to surface

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/PC/SensorCharacteristic

Attribute	Example Value
wavelength	SensorCharacteristicContainer

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GLAS/Sensor/PC/SensorCharacteristic/wavelength

Attribute	Example Value
SensorCharacteristicName	wavelength
SensorCharacteristicDescription	detector
SensorCharacteristicDataType	varchar
SensorCharacteristicUnit	nanometer
SensorCharacteristicValue	532nm

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GPS

Attribute	Example Value
InstrumentShortName	GPS
InstrumentLongName	Global Positioning System Receiver
InstrumentTechnique	Radionavigation
NumberofSensors	1

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GPS/Sensor

Attribute	Example Value
GPS_Receiver	SensorContainer

/METADATA/COLLECTIONMETADATA/Platform/ICESat/Instrument/GPS/Sensor/GPS_Receiver

Attribute	Example Value
SensorShortName	GPS Receiver
SensorLongName	Dual frequency GPS receiver

SensorTechnique	Pseudorange and carrier phase

/METADATA/COLLECTIONMETADATA/Platform/ICESat/PlatformCharacteristic

Attribute	Example Value
OrbitInclination	PlatformCharacteristicContainer
OrbitalPeriod	PlatformCharacteristicContainer

/METADATA/COLLECTIONMETADATA/Platform/ICESat/PlatformCharacteristic/OrbitInclination

Attribute	Example Value
PlatformCharacteristicName	OrbitInclination
PlatformCharacteristicDescription	Angle between the orbit plane and the Earth's equatorial plane
PlatformCharacteristicDataType	float
PlatformCharacteristicUnit	Degrees
PlatformCharacteristicValue	94.0

/METADATA/COLLECTIONMETADATA/Platform/ICESat/PlatformCharacteristic/OrbitalPeriod

Attribute	Example Value
PlatformCharacteristicName	OrbitalPeriod
PlatformCharacteristicDescription	Orbital period in decimal minutes.
PlatformCharacteristicDataType	float
PlatformCharacteristicUnit	Minutes
PlatformCharacteristicValue	96.7

/METADATA/COLLECTIONMETADATA/ProcessingLevel

Attribute	Example Value
ProcessingLevelDescription	Geophysical Quantities at the sensor resolution or geolocated
ProcessingLevelID	1B

/METADATA/COLLECTIONMETADATA/Spatial

Attribute	Example Value
SpatialCoverageType	Horizontal
WestBoundingCoordinate	-180.0
NorthBoundingCoordinate	90.0
EastBoundingCoordinate	180.0
SouthBoundingCoordinate	-90.0

/METADATA/COLLECTIONMETADATA/StorageMediumClass

Attribute	Example Value
StorageMedium	Online

/METADATA/COLLECTIONMETADATA/Temporal

Attribute	Example Value
TimeType	UTC
DateType	J2000
TemporalRangeType	Continuous Range
PrecisionofSeconds	2
EndsatPresentFlag	Y
RangeBeginningDate	2003-01-13
RangeBeginningTime	00:00:00
RangeEndingDate	2010-01-13
RangeEndingTime	00:00:00

/METADATA/INVENTORYMETADATA

Attribute	Example Value
PGEVersion	Version 1.2
ShortName	GLAH06
VersionID	33
RangeBeginningTime	02:51:46
RangeEndingTime	03:13:12
RangeBeginningDate	2008-03-03
RangeEndingDate	2008-03-03

/METADATA/INVENTORYMETADATA/ECSDataGranule

Attribute	Example Value
ReprocessingPlanned	no further update anticipated
ReprocessingActual	reprocessed
LocalGranuleID	GLAH06_633_2123_002_0141_1_01_0001.H5
ProductionDateTime	2013-01-16T18:57:52
LocalVersionID	33

/METADATA/INVENTORYMETADATA/InputGranule

Attribute	Example Value
InputPointer	gla06_test_1.ctl, tai-utc.dat, GLA06_633_2123_002_0141_1_01_0001.DAT, DsESDTGlGLAH06.033.desc

/METADATA/INVENTORYMETADATA/MeasuredParameter

Attribute	Example Value
ParameterName	Surface_Elevation, Surface_Reflectance

/METADATA/INVENTORYMETADATA/OrbitCalculatedSpatialDomain

Attribute	Example Value
OrbitNumber	27949
StartOrbitNumber	27949
StopOrbitNumber	27949
EquatorCrossingLongitude	-147.35388
EquatorCrossingTime	02:38:23
EquatorCrossingDate	2008-03-03

/METADATA/INVENTORYMETADATA/ProductSpecificMetadata

Attribute	Example Value
PercentGroundHit	0
OrbitQuality	6
Track	141
Track_Segment	1
Instrument_State	373340
ReferenceOrbit	1
Cycle	2
SP_ICE_PATH_NO	3163
SP_ICE_GLAS_StartBlock	NOT SET
SP_ICE_GLAS_EndBlock	NOT SET
Instance	23
Range_Bias	0
Instrument_State_Date	2008-02-13
Instrument_State_Time	22:27:25
Range_Bias_Date	2008-02-13
Range_Bias_Time	22:27:27
Timing_Bias	0
Timing_Bias_Date	2008-02-13

Timing_Bias_Time	22:27:27
identifier_product_doi	10.5067/ICESAT/GLAS/DATA106
identifier_file_uuid	04D42283-3EE8-40A8-A488-AE95192F7F20
identifier_product_doi_authority	http://dx.doi.org

/METADATA/PROVENANCE

/METADATA/PROVENANCE/STEP_1

Attribute	Example Value
ProcessDateTime	2011-09-17T02:59:51

/METADATA/PROVENANCE/STEP_1/ProcessAgent

Attribute	Example Value
Name	glas_alt
Type	1B
Version	6.0.1
Description	This process is an instantiation of the GLAS Science Algorithm Software (GSAS) 1B ATBDs.

/METADATA/PROVENANCE/STEP_1/ProcessInput

Attribute	Example Value
Name	GLA05_633_2123_002_0141_1_01_0001.DAT, GLA09_633_2123_002_0141_0_01_0001.DAT, GLA11_633_2123_002_0141_0_01_0001.DAT, ANC01_006_20080302_180000_01_0000.DAT, ANC01_006_20080303_000000_01_0000.DAT, ANC01_006_20080302_180000_01_0002.DAT, ANC01_006_20080303_000000_01_0002.DAT, ANC01_006_20080302_180000_01_0003.DAT, ANC01_006_20080303_000000_01_0003.DAT, ANC01_006_20080302_180000_01_0004.DAT, ANC01_006_20080303_000000_01_0004.DAT, ANC01_006_20080302_180000_01_0001.DAT, ANC01_006_20080303_000000_01_0001.DAT, ANC01_006_20080302_180000_01_0005.DAT, ANC01_006_20080303_000000_01_0005.DAT, ANC01_006_20080302_180000_01_0006.DAT, ANC01_006_20080303_000000_01_0006.DAT, ANC01_006_20080302_180000_01_0007.DAT, ANC01_006_20080303_000000_01_0007.DAT, ANC01_006_20080302_180000_01_0008.DAT, ANC01_006_20080303_000000_01_0008.DAT, ANC01_006_20080302_180000_01_0009.DAT, ANC01_006_20080303_000000_01_0009.DAT, ANC01_006_20080302_180000_01_0010.DAT, ANC01_006_20080303_000000_01_0010.DAT, ANC04_007_20080302_235946_01_0001.DAT, anc07_033_02_0000.dat, anc07_033_02_0001.dat, anc07_033_02_0002.dat, anc07_033_02_0003.dat, anc07_033_02_0004.dat, anc07_033_02_0005.dat, anc07_033_02_0006.dat, ANC08_015_20080302_235946_01_0001.DAT, ANC09_076_20080302_235946_01_0001.DAT, anc12_004_01_0000.dat, anc12_004_01_0001.dat, anc13_006_01_0000.dat, anc16_004_01_0000.dat, anc17_004_01_0000.dat, anc25_005_20090101_000000_01_0000.dat, anc27_001_01_0000.dat, anc27_001_01_0001.dat, ANC33_001_20100406_000000_01_0000.DAT, anc41_009_01_0000.dat, anc45_033_03_0001.dat, anc45_033_03_0002.dat, anc45_033_03_0003.dat, anc45_033_03_0004.dat, anc45_033_03_0005.dat, anc45_033_03_0006.dat, anc45_033_03_0007.dat, anc45_033_03_0008.dat, anc45_033_03_0009.dat, anc45_033_03_0010.dat, anc45_033_03_0011.dat, anc45_033_03_0012.dat, anc45_033_03_0013.dat, anc45_033_03_0014.dat, anc45_033_03_0015.dat, anc51_003_01_3163.dat, anc51_003_01_3164.dat, anc51_003_01_3165.dat, anc51_003_01_3166.dat, anc51_003_01_3167.dat, anc51_003_01_3168.dat, anc51_003_01_3169.dat, anc51_003_01_3170.dat, anc51_003_01_3171.dat, anc51_003_01_3172.dat, anc51_003_01_3173.dat, anc51_003_01_3174.dat, anc51_003_01_3175.dat, anc51_003_01_3176.dat, anc51_003_01_3177.dat, anc52_007_01_0001.dat, anc52_007_01_0002.dat, anc54_002_01_0001.dat, anc54_002_01_0002.dat, anc54_002_01_0003.dat, anc54_002_01_0004.dat, anc54_002_01_0005.dat, anc54_002_01_0006.dat, anc55_001_01_0000.dat, ANC56_001_20090707_000000_01_0000.DAT, ANC57_001_20101119_000000_01_0000.DAT, anc58_002_01_3163.dat, anc58_002_01_3164.dat, anc58_002_01_3165.dat, anc58_002_01_3166.dat, anc58_002_01_3167.dat, anc58_002_01_3168.dat, anc58_002_01_3169.dat, anc58_002_01_3170.dat, anc58_002_01_3171.dat, anc58_002_01_3172.dat, anc58_002_01_3173.dat, anc58_002_01_3174.dat, anc58_002_01_3175.dat, anc58_002_01_3176.dat, anc58_002_01_3177.dat
Type	GLA05, GLA09, GLA11, ANC04, anc07, anc07, anc07, anc07, anc07, anc07, ANC08, ANC09, anc12, anc12, anc13, anc16, anc17, anc25, anc27, anc27, ANC33, anc41, anc45, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc51, anc52, anc52, anc54, anc54, anc54, anc54, anc54, anc54, anc55, ANC56, ANC57, anc58, anc58, anc58, anc58, anc58, anc58, anc58, anc58, anc58, anc58, anc58, anc58, anc58, anc58, anc58
Version	633, 633, 633, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 006, 007, 033, 033, 033, 033, 033, 033, 033, 015, 076, 004, 004, 006, 004, 004, 005, 001, 001, 001, 009, 033, 033, 033, 033, 033, 033, 033, 033, 033, 033, 033, 033, 033, 033, 003, 003, 003, 003, 003, 003, 003, 003, 003, 003, 003, 003, 003, 003, 003, 007, 007, 002, 002, 002, 002, 002, 002, 001, 001, 001, 002, 002, 002, 002, 002, 002, 002, 002, 002, 002, 002, 002, 002, 002, 002, 002, 002, 002

/METADATA/PROVENANCE/STEP_1/ProcessOutput

Attribute	Example Value
Name	GLA06_633_2123_002_0141_1_01_0001.DAT
Type	GLA06
Version	633

/METADATA/PROVENANCE/STEP_2

Attribute	Example Value
ProcessDateTime	2013-01-16T18:57:52.000000Z

/METADATA/PROVENANCE/STEP_2/ProcessAgent

Attribute	Example Value
Name	GLA06_h5_convert
Type	Data_Reformat
Version	Version 1.2 (January 2013)
Description	GLA06 Conversion PGE

/METADATA/PROVENANCE/STEP_2/ProcessInput

Attribute	Example Value
Name	./gla06_test_1.ctl, ../data/tai-utc.dat, ./GLA06_633_2123_002_0141_1_01_0001.DAT, ./DsESDTGlGLAH06.033.desc
Type	IN_CNTL, IN_ANC_TAIUTC, IN_GLA06, IN_ESDT
Version	0, 0, 1, 1

/METADATA/PROVENANCE/STEP_2/ProcessOutput

Attribute	Example Value
Name	./GLAH06_633_2123_002_0141_1_01_0001.H5
Type	OUT_GLAH06
Version	1
UUID	04D42283-3EE8-40A8-A488-AE95192F7F20
DOI	10.5067/ICESAT/GLAS/DATA106