

GLAH05 Product Data Dictionary

File-Level (Global) Attributes

Attribute	Example Value
featureType	timeSeries
ShortName	GLAH05
title	GLAS/ICESat L1B Global Waveform-based Range Corrections Data (HDF5)
comment	The level 1B waveform parameterization data will contain waveform-based range corrections and surface characteristics at the full 40 per second resolution. Data granules will contain approximately 23 minutes (1/4 orbit) of data.
summary	GLAH05 contains scientific investigations of surface features defined by the waveform parameterization. File contains range corrections and the parameterizations of the waveform that were used to calculate surface elevation, and other surface characteristics. The data values were used as input data values to compute parameters on GLAH06 and GLAH12-15. Each GLAH05 file was created from an equivalent GLA05 binary formatted file. The provenance metadata shows the history that created the GLA05.
license	http://nsidc.org/data/icesat/disclaimer.html
references	https://nsidc.org/data/glah01-glah05-glah06-glah12-glah13-glah14-glah15/versions/34/documentation (Guide Document for this product at NSIDC), http://nsidc.org/data/icesat/ (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/data/icesat
platform	Ice, Cloud, and Land Elevation Satellite (ICESat)
instrument	Geoscience Laser Altimeter System (GLAS)
processing_level	1B

Attribute	Example Value
date_created	2014-08-19T06:08:34
spatial_coverage_type	Horizontal
history	2014-05-24T04:01:03 glas_alt 6.1 GLA05_634_2103_002_0407_1_01_0001.DAT, 2014-08-19T06:08:34.000000Z GLA05_h5_convert Version 1.4 (July 2014) /GLAH05_634_2103_002_0407_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, Earth Science > Hydrosphere > Glaciers/Ice Sheets > Glacier Elevation/Ice Sheet Elevation, Earth Science > Cryosphere > Glaciers/Ice Sheets > Glacier Elevation/Ice Sheet Elevation
keywords_vocabulary	GCMD Science Keywords Version 6.0
standard_name_vocabulary	not_set
naming_authority	http://dx.doi.org/10.5067/ICESAT/GLAS/DATA108
project	Ice, Cloud, and Land Elevation Satellite (GLAS_HDF)
time_type	UTC
date_type	J2000
time_coverage_start	2003-11-18T01:51:38
time_coverage_end	2003-11-18T02:12:57
time_coverage_duration	1620
source	Satellite Measurements
HDFVersion	HDF5 1.8.9
identifier_file_uuid	2868de04-82ed-4282-94b3-24f078a309d8
identifier_product_doi	10.5067/ICESAT/GLAS/DATA108
identifier_product_type	GLAH05
identifier_product_format_version	1.0
Conventions	CF-1.6

Attribute	Example Value
institution	National Aeronautics and Space Administration (NASA)

Group: /Data_1HZ

This group contain 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 34 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				
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 34 GLAS Binary Data				
i_shot_count	INTEGER (UNLIMITED)	GLAS shot counter (NOT_SET)	NOT_SET	Identifies each laser shot within a record index. A combination of <code>i_rec_ndx</code> and <code>i_shot_count</code> can be used to uniquely identify each GLAS laser shot.	Rel 34 GLAS Binary Data				
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 34 GLAS Binary Data				
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 34 GLAS Binary Data				
shot_time_flg	INTEGER_1 (UNLIMITED)	time correction flag (NOT_SET)	NOT_SET	Shot time flag; Indicates what shot time is used. <table border="1" data-bbox="805 1661 1408 1793"> <thead> <tr> <th>flag values</th> <th>flag_meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1</td> <td>transmit_time ground_bounce_time</td> </tr> </tbody> </table>	flag values	flag_meanings	0, 1	transmit_time ground_bounce_time	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	transmit_time ground_bounce_time								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
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 <table border="1" data-bbox="805 273 1408 407"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_applied applied</td> </tr> </table>	flag values	flag_meanings	0, 1	not_applied applied	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_applied applied								
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. <table border="1" data-bbox="805 529 1408 663"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_applied applied</td> </tr> </table>	flag values	flag_meanings	0, 1	not_applied applied	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_applied applied								
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. <table border="1" data-bbox="805 810 1408 945"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>applied not_applied</td> </tr> </table>	flag values	flag_meanings	0, 1	applied not_applied	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	applied not_applied								
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 <table border="1" data-bbox="805 1066 1408 1201"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>applied not_applied</td> </tr> </table>	flag values	flag_meanings	0, 1	applied not_applied	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	applied not_applied								

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 first laser spot in this record, computed from the precision orbit, precision attitude, and preliminary range. The preliminary range is used with no geodetic corrections applied. The values are in degrees North.	Rel 34 GLAS Binary Data	DS_UTCTime_1
d_lon	DOUBLE (UNLIMITED)	Spot 1 Coordinate Data, Longitude Corrected (longitude)	degrees_east	The geodetic longitude of the first laser spot in this record, computed from the precision orbit, precision attitude, and preliminary range. The preliminary range is used with no geodetic corrections applied. The values are in east longitude.	Rel 34 GLAS Binary Data	DS_UTCTime_1

Group: Data_1HZ/Packet_data

This group contains packet-availability information.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinate				
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 <table border="1"> <thead> <tr> <th>flag values</th> <th>flag_meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
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 <table border="1"> <thead> <tr> <th>flag values</th> <th>flag_meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
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 <table border="1"> <thead> <tr> <th>flag values</th> <th>flag_meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
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 <table border="1"> <thead> <tr> <th>flag values</th> <th>flag_meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
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 <table border="1"> <thead> <tr> <th>flag values</th> <th>flag_meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
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0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinate:				
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 <table border="1" data-bbox="805 270 1304 464"> <thead> <tr> <th>flag values</th> <th>flag meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
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0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
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 <table border="1" data-bbox="805 583 1304 777"> <thead> <tr> <th>flag values</th> <th>flag meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
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0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
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 <table border="1" data-bbox="805 896 1304 1089"> <thead> <tr> <th>flag values</th> <th>flag meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag meanings									
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 <table border="1" data-bbox="805 1178 1304 1371"> <thead> <tr> <th>flag values</th> <th>flag meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
apid_CD1064_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	1064 Cloud Digitizer packet APID availability flag <table border="1" data-bbox="805 1459 1304 1652"> <thead> <tr> <th>flag values</th> <th>flag meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
apid_ADSci_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Ancillary science packet APID availability flag <table border="1" data-bbox="805 1745 1304 1938"> <thead> <tr> <th>flag values</th> <th>flag meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinate:				
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 <table border="1" data-bbox="805 270 1304 464"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
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 <table border="1" data-bbox="805 583 1304 777"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
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 <table border="1" data-bbox="805 896 1304 1089"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
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0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
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 <table border="1" data-bbox="805 1209 1304 1402"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
apid_CT20_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	CT HW telemetry packet #1 (APID 20) APID availability flag <table border="1" data-bbox="805 1522 1304 1715"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
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0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinate:				
apid_CT21_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	CT HW telemetry packet #2 (APID 21) APID availability flag <table border="1" data-bbox="805 270 1304 464"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
apid_CT22_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	CT HW telemetry packet #3 (APID 22) APID availability flag <table border="1" data-bbox="805 583 1304 777"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
apid_CT23_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	CT HW telemetry packet #4 (APID 23) APID availability flag <table border="1" data-bbox="805 896 1304 1089"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
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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 <table border="1" data-bbox="805 1209 1304 1402"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
apid_SS24_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Small software telemetry packet #1 (APID 24) APID availability flag <table border="1" data-bbox="805 1522 1304 1715"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									

Label	Datatype (Dimensions)	long_name (standard_name)	units	description		source	coordinate:
apid_LS25_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Large software telemetry packet #1 (APID 25) APID availability flag		Rel 34 GLAS Binary Data	DS_UTCTin
				flag values	flag_meanings		
				0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled		
apid_LS55_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	Large software telemetry packet #2 (APID 55) APID availability flag		Rel 34 GLAS Binary Data	DS_UTCTin
				flag values	flag_meanings		
				0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled		
apid_GPS_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	GPS telemetry packet APID availability flag		Rel 34 GLAS Binary Data	DS_UTCTin
				flag values	flag_meanings		
				0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled		
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		Rel 34 GLAS Binary Data	DS_UTCTin
				flag values	flag_meanings		
				0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled		
apid_LPA_1_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	LPA packet #1 APID availability flag		Rel 34 GLAS Binary Data	DS_UTCTin
				flag values	flag_meanings		
				0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled		
apid_LPA_2_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	LPA packet #2 APID availability flag		Rel 34 GLAS Binary Data	DS_UTCTin
				flag values	flag_meanings		
				0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled		

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinate:				
apid_LPA_3_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	LPA packet #3 APID availability flag <table border="1"> <thead> <tr> <th>flag values</th> <th>flag_meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									
apid_LPA_4_flg	INTEGER_1 (UNLIMITED)	APID Data Availability Flag (NOT_SET)	NOT_SET	LPA packet #4 APID availability flag <table border="1"> <thead> <tr> <th>flag values</th> <th>flag_meanings</th> </tr> </thead> <tbody> <tr> <td>0, 1, 2</td> <td>present filled_at_EDOS never_received_ISIPS_filled</td> </tr> </tbody> </table>	flag values	flag_meanings	0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled	Rel 34 GLAS Binary Data	DS_UTCTin
flag values	flag_meanings									
0, 1, 2	present filled_at_EDOS never_received_ISIPS_filled									

Group: Data_1HZ/Transmit_Energy

This group contains information relating to transmit energy.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
i_gval_tx	INTEGER (UNLIMITED)	Gain Value used for Transmitted Pulse - uncalibrated (NOT_SET)	counts	Gain value used for transmitted pulse - uncalibrated	Rel 34 GLAS Binary Data	DS_UTCTime_1
d_beam_azimuth	DOUBLE (UNLIMITED)	Azimuth (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 34 GLAS Binary Data	DS_UTCTime_1
d_beam_coelev	DOUBLE (UNLIMITED)	Co-elevation (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 34 GLAS Binary Data	DS_UTCTime_1
i_N_val	INTEGER (UNLIMITED)	Value of N (NOT_SET)	gates	Value of N used for waveform compression for the frame. From APID19, Offset 236. The decompress time array is available on GLAH01.	Rel 34 GLAS Binary Data	DS_UTCTime_1
i_r_val	INTEGER (UNLIMITED)	Value of r (NOT_SET)	NOT_SET	Value of r used for waveform compression for frame. From APID19, Offset 238. Not valid if APID19 is missing. The decompress time array is available on GLAH01.	Rel 34 GLAS Binary Data	DS_UTCTime_1

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
i_compRatio_p	INTEGER (UNLIMITED)	Compression Ratios (NOT_SET)	NOT_SET	Averaging value p for frame. From APID19, Offset 232. First N downlink samples are generated by averaging p raw digitized elements and the rest of the allocated samples in the waveform by averaging q elements (see i_compRatio_q). The decompress time array is available on GLAH01.	Rel 34 GLAS Binary Data	DS_UTCTime_1
i_compRatio_q	INTEGER (UNLIMITED)	Compression Ratios (NOT_SET)	NOT_SET	Averaging value q for frame. From APID19, Offset 232. First N downlink samples are generated by averaging p raw digitized elements and the rest of the allocated samples in the waveform by averaging q elements. The decompress time array is available on GLAH01.	Rel 34 GLAS Binary Data	DS_UTCTime_1

Group: Data_1HZ/Quality

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

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
orbit_pred_flg	INTEGER_1 (UNLIMITED)	POD flag (Orbit Flag) (flags)	NOT_SET	Orbit flag; Predicted or precision orbit flag <table border="1" data-bbox="816 982 1466 1171"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>precision_orbit_used predicted_orbit_used onboard_orbit_used</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	precision_orbit_used predicted_orbit_used onboard_orbit_used	Rel 3 GLAS Binary Data
flag values	flag_meanings								
0, 1, 2	precision_orbit_used predicted_orbit_used onboard_orbit_used								
orbit_man_flg	INTEGER_1 (UNLIMITED)	Maneuver flag (NOT_SET)	NOT_SET	If maneuvers occurred, orbit is considered degraded. <table border="1" data-bbox="816 1266 1466 1455"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>no_maneuvers maneuvers_occurred_during_this_record</td> </tr> </table>	flag values	flag_meanings	0, 1	no_maneuvers maneuvers_occurred_during_this_record	Rel 3 GLAS Binary Data
flag values	flag_meanings								
0, 1	no_maneuvers maneuvers_occurred_during_this_record								
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 <table border="1" data-bbox="816 1581 1466 1707"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>no_model_problems model_problems</td> </tr> </table>	flag values	flag_meanings	0, 1	no_model_problems model_problems	Rel 3 GLAS Binary Data
flag values	flag_meanings								
0, 1	no_model_problems model_problems								
orbit_att_flg	INTEGER_1 (UNLIMITED)	Attitude flag (NOT_SET)	NOT_SET	modeled_attitude_used indicates possible orbit degradation <table border="1" data-bbox="816 1812 1466 1990"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>instrument_attitude_used_for_orbit modeled_attitude_used</td> </tr> </table>	flag values	flag_meanings	0, 1	instrument_attitude_used_for_orbit modeled_attitude_used	Rel 3 GLAS Binary Data
flag values	flag_meanings								
0, 1	instrument_attitude_used_for_orbit modeled_attitude_used								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
orbit_array_flg	INTEGER_1 (UNLIMITED)	Solar Array Orientation flag (NOT_SET)	NOT_SET	modeled_solar_ray_orientation indicates possible orbit degradation <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>solar_ray_orientation_used_from measurement modeled_solar_ray_orientation</td> </tr> </table>	flag values	flag_meanings	0, 1	solar_ray_orientation_used_from measurement modeled_solar_ray_orientation	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	solar_ray_orientation_used_from measurement modeled_solar_ray_orientation								
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 <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>no_GPS_data_outage GPS_data_missing</td> </tr> </table>	flag values	flag_meanings	0, 1	no_GPS_data_outage GPS_data_missing	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	no_GPS_data_outage GPS_data_missing								
rng_ldtide_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag (NOT_SET)	NOT_SET	Load tides flag; Indicates if a correction for the dynamic effect of load tides has been applied to the range before the elevation was calculated <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>applied not_applied</td> </tr> </table>	flag values	flag_meanings	0, 1	applied not_applied	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	applied not_applied								
rng_octide_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag (NOT_SET)	NOT_SET	Ocean tides flag; Indicates if a correction for the dynamic effect of ocean tides has been applied to the range before the elevation was calculated <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>applied not_applied</td> </tr> </table>	flag values	flag_meanings	0, 1	applied not_applied	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	applied not_applied								
rng_setide_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag (NOT_SET)	NOT_SET	Solid earth tides flag; Indicates if a correction for the dynamic effect of solid earth tides has been applied to the range before the elevation was calculated. <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>applied not_applied</td> </tr> </table>	flag values	flag_meanings	0, 1	applied not_applied	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	applied not_applied								
rng_drytrop_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag (NOT_SET)	NOT_SET	Dry troposphere flag; Indicates if a correction for propagation errors due to the dry troposphere was applied to the range before the elevation was calculated. <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>applied not_applied</td> </tr> </table>	flag values	flag_meanings	0, 1	applied not_applied	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	applied not_applied								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
rng_wettrop_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag (NOT_SET)	NOT_SET	Wet troposphere flag Indicates if a correction for propagation errors due to the wet troposphere was applied to the range before the elevation was calculated. <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>applied not_applied</td> </tr> </table>	flag values	flag_meanings	0, 1	applied not_applied	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	applied not_applied								
rng_intbias_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag (NOT_SET)	NOT_SET	Internal range bias flag; Indicates if 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. <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>applied not_applied</td> </tr> </table>	flag values	flag_meanings	0, 1	applied not_applied	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	applied not_applied								
rng_plbias_flg	INTEGER_1 (UNLIMITED)	Range Correction Flag (NOT_SET)	NOT_SET	Post-launch range bias flag; Indicates if 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. <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>applied not_applied</td> </tr> </table>	flag values	flag_meanings	0, 1	applied not_applied	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	applied not_applied								
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 <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>within_limit outside_limits</td> </tr> </table>	flag values	flag_meanings	0, 1	within_limit outside_limits	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	within_limit outside_limits								
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 <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_ocean_sweep ocean_sweep</td> </tr> </table>	flag values	flag_meanings	0, 1	not_ocean_sweep ocean_sweep	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	not_ocean_sweep ocean_sweep								
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 <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_pointing pointing</td> </tr> </table>	flag values	flag_meanings	0, 1	not_pointing pointing	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	not_pointing pointing								
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 <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_pointing pointing</td> </tr> </table>	flag values	flag_meanings	0, 1	not_pointing pointing	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	not_pointing pointing								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
att_actual_flg	INTEGER_1 (UNLIMITED)	Attitude Flag 1 (NOT_SET)	NOT_SET	Actual data bits flag; Indicates if the first 3 Attitude Flags have been set based on actual data, if ignore, then IGNORE those bits. <table border="1" data-bbox="818 268 1464 403"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>actual ignore</td> </tr> </table>	flag values	flag_meanings	0, 1	actual ignore	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	actual ignore								
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 portion of the time of this frame or noisy and missing for at least a portion of the time of this frame <table border="1" data-bbox="818 554 1464 688"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2, 3</td> <td>good missing noisy missing_noisy</td> </tr> </table>	flag values	flag_meanings	0, 1, 2, 3	good missing noisy missing_noisy	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1, 2, 3	good missing noisy missing_noisy								
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 <table border="1" data-bbox="818 865 1464 999"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2, 3</td> <td>good missing noisy missing_noisy</td> </tr> </table>	flag values	flag_meanings	0, 1, 2, 3	good missing noisy missing_noisy	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1, 2, 3	good missing noisy missing_noisy								
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 <table border="1" data-bbox="818 1289 1464 1444"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2, 3, 4, 5, 6, 7</td> <td>good no_star no_laser no_crs only_crs only_laser only_star missing_lrs</td> </tr> </table>	flag values	flag_meanings	0, 1, 2, 3, 4, 5, 6, 7	good no_star no_laser no_crs only_crs only_laser only_star missing_lrs	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1, 2, 3, 4, 5, 6, 7	good no_star no_laser no_crs only_crs only_laser only_star missing_lrs								
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 <table border="1" data-bbox="818 1600 1464 1734"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>good uncorrected</td> </tr> </table>	flag values	flag_meanings	0, 1	good uncorrected	Rel 3 GLAS Binar Data
flag values	flag_meanings								
0, 1	good uncorrected								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source
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	Rel 3 GLAS Binary Data
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>good not_good</td> </tr> </table>	
flag values	flag_meanings				
0, 1	good not_good				
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	Rel 3 GLAS Binary Data
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>good not_good</td> </tr> </table>	
flag values	flag_meanings				
0, 1	good not_good				
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	Rel 3 GLAS Binary Data
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>usable not_usable</td> </tr> </table>	
flag values	flag_meanings				
0, 1	usable not_usable				

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 34 GLAS Binary Data	NOT_SET
DS_PeakNumber	INTEGER (UNLIMITED)	Peak index number (NOT_SET)	NOT_SET	This array indicates the index of the detected waveform peak for several parameters. PeakNumber=1 indicates the detected peak closest to the ground; PeakNumber=6 indicates the peak furthest from the ground.	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

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 34 GLAS Binary Data	DS_UTCTime_40
i_shot_count	INTEGER (UNLIMITED)	GLAS shot counter (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 34 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 Coordinate Data - Latitude (Uncorrected) (latitude)	degrees_north	The geodetic latitude of the forty laser spots in this record, computed from the precision orbit, precision attitude, and preliminary range. The preliminary range is used with no geodetic corrections applied. The values are in degrees North.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_lon	DOUBLE (UNLIMITED)	Spot Coordinate Data - Longitude (Uncorrected) (longitude)	degrees_east	The geodetic longitude of the forty laser spots in this record, computed from the precision orbit, precision attitude, and preliminary range. The preliminary range is used with no geodetic corrections applied. The values are in east longitude.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Elevations

This group contains surface-related parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_refRngNs	DOUBLE (UNLIMITED)	Reference Range (altimeter_range)	ns	Two-way reference range in time measured from the centroid of the transmit pulse to the last received echo digitizer gate telemetered (farthest from the spacecraft).	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_elev	DOUBLE (UNLIMITED)	Spot Surface Elevation with respect to ITRF ellipsoid (Uncorrected) (NOT_SET)	meters	The surface elevation with respect to ellipsoid of the forty laser spots in this record. The elevation is calculated using the preliminary range corrected to be from the Gaussian fit to the transmit, the precision orbit, and precision attitude with no geodetic corrections applied.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_centroidInstr	DOUBLE (UNLIMITED)	Centroid retracker offset using max peak (NOT_SET)	ns	Offset to be added to d_refRng to give the two-way range in time to the location of the centroid of the received echo from signal begin through signal end defined by the standard parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_GmCns	DOUBLE (UNLIMITED)	Transmit pulse Gaussian peak location to centroid in ns	ns	The difference in nanoseconds of the Gaussian fit to the transmit pulse and the centroid of it. This correction was applied to the range before the computation of elevation. It is an additive correction to an elevation relative to Tx centroid to make the elevation relative to the Tx Gaussian.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Elevation_Flags

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

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
wfq1_maxiter_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Alternate parameters; 1 = maximum iteration exceeded for alternate parameters <table border="1" data-bbox="816 747 1430 884"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_exceeded exceeded</td> </tr> </table>	flag values	flag_meanings	0, 1	not_exceeded exceeded	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_exceeded exceeded								
wfq2_maxiter_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Standard parameters; 1 = maximum iteration exceeded for standard parameters <table border="1" data-bbox="816 1003 1430 1140"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_exceeded exceeded</td> </tr> </table>	flag values	flag_meanings	0, 1	not_exceeded exceeded	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_exceeded exceeded								
wfq1_ledge_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Leading edge for alternate; 1 = no leading edge detected for alternate parameters <table border="1" data-bbox="816 1260 1430 1396"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>detected not_detected</td> </tr> </table>	flag values	flag_meanings	0, 1	detected not_detected	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	detected not_detected								
wfq1_tedge_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Trailing edge for alternate; 1 = no trailing edge detected for alternate parameters <table border="1" data-bbox="816 1516 1430 1652"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>detected not_detected</td> </tr> </table>	flag values	flag_meanings	0, 1	detected not_detected	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	detected not_detected								
wfq2_ledge_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Leading edge for standard; 0 = leading edge detected for standard parameters <table border="1" data-bbox="816 1772 1430 1908"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>detected not_detected</td> </tr> </table>	flag values	flag_meanings	0, 1	detected not_detected	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	detected not_detected								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
wfq2_tedge_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Trailing edge for standard; 0 = trailing edge detected for standard parameters <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>detected not_detected</td> </tr> </table>	flag values	flag_meanings	0, 1	detected not_detected	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	detected not_detected								
wfq_ld_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Land surface; 1 = possible land surface as indicated by regional ID grid <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_land possible_land</td> </tr> </table>	flag values	flag_meanings	0, 1	not_land possible_land	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_land possible_land								
wfq_oc_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Ocean surface; 1 = possible ocean surface as indicated by regional ID grid <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_ocean possible_ocean</td> </tr> </table>	flag values	flag_meanings	0, 1	not_ocean possible_ocean	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_ocean possible_ocean								
wfq_is_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Icesheet surface; 1 = possible icesheet surface as indicated by regional ID grid <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_icesheet possible_icesheet</td> </tr> </table>	flag values	flag_meanings	0, 1	not_icesheet possible_icesheet	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_icesheet possible_icesheet								
wfq_si_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Sea ice surface; 1 = possible sea ice surface as indicated by regional ID grid <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_seaice possible_seaice</td> </tr> </table>	flag values	flag_meanings	0, 1	not_seaice possible_seaice	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_seaice possible_seaice								
wfq_missing_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Invalid WF; 1 = invalid WF (filled/missing data) <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>valid not_valid</td> </tr> </table>	flag values	flag_meanings	0, 1	valid not_valid	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	valid not_valid								
wfq_nopulse_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	1 = no transmitted pulse <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>pulse no_pulse</td> </tr> </table>	flag values	flag_meanings	0, 1	pulse no_pulse	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	pulse no_pulse								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
wfq1_nofit_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Fit for alternate parameters; 1 = no fit for alternate parameters. Also set if no signal or invalid. <table border="1" data-bbox="818 273 1430 407"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>fit no_fit</td> </tr> </table>	flag values	flag_meanings	0, 1	fit no_fit	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	fit no_fit								
wfq2_nofit_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Fit for standard parameters; 1 = no fit for standard parameters. Also set if no signal or invalid. <table border="1" data-bbox="818 529 1430 663"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>fit no_fit</td> </tr> </table>	flag values	flag_meanings	0, 1	fit no_fit	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	fit no_fit								
wfq1_noise_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Alternate parameter noise; 0 = background noise and standard deviation of noise were calculated for alternate parameters <table border="1" data-bbox="818 785 1430 919"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>calculated not_calculated</td> </tr> </table>	flag values	flag_meanings	0, 1	calculated not_calculated	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	calculated not_calculated								
wfq2_noise_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Standard parameter noise; 0 = background noise and standard deviation of noise were calculated for standard parameters <table border="1" data-bbox="818 1041 1430 1176"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>calculated not_calculated</td> </tr> </table>	flag values	flag_meanings	0, 1	calculated not_calculated	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	calculated not_calculated								
wfq1_sig_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Signal for alternate; No signal detected for alternate parameters for shot (Set if a waveform was present. i.e.: not fill data--but no leading or trailing edge detected) <table border="1" data-bbox="818 1318 1430 1453"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>detected not_detected</td> </tr> </table>	flag values	flag_meanings	0, 1	detected not_detected	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	detected not_detected								
wfq2_sig_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Signal for standard signal detected for standard parameters for shot (Set if a waveform was present. i.e.: not fill data--but no leading or trailing edge detected) <table border="1" data-bbox="818 1604 1430 1738"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>detected not_detected</td> </tr> </table>	flag values	flag_meanings	0, 1	detected not_detected	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	detected not_detected								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
wfq1_region_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	WF Fit Alternate; 0=WF fit using all gates; 1=WF fit using selected region from signal begin minus I_OFFSETB1 to signal end plus I_OFFSETE1 for alternate parameters for shot 40 (the offsets are in anc07_0004)	Rel 34 GLAS Binary Data				
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>all_gates region</td> </tr> </table>	flag values	flag_meanings	0, 1	all_gates region	
flag values	flag_meanings								
0, 1	all_gates region								
wfq2_region_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	WF Fit Standard; 0=WF fit using all gates; 1=WF fit using selected region from signal begin minus I_OFFSETB2 to signal end plus I_OFFSETE2 for standard parameters for shot 40 (the offsets are in anc07_0004)	Rel 34 GLAS Binary Data				
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>all_gates region</td> </tr> </table>	flag values	flag_meanings	0, 1	all_gates region	
flag values	flag_meanings								
0, 1	all_gates region								
wfq1_sd_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Fit standard deviation alternate; 1 = standard deviation of fit (alternate parameters) is too large	Rel 34 GLAS Binary Data				
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>valid not_valid</td> </tr> </table>	flag values	flag_meanings	0, 1	valid not_valid	
flag values	flag_meanings								
0, 1	valid not_valid								
wfq2_sd_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Fit standard deviation standard; 1 = standard deviation of fit standard parameters) is too large	Rel 34 GLAS Binary Data				
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>valid not_valid</td> </tr> </table>	flag values	flag_meanings	0, 1	valid not_valid	
flag values	flag_meanings								
0, 1	valid not_valid								
wfq1_fit2_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Fit alternate; 1 = a second fit was tried for alternate parameters.	Rel 34 GLAS Binary Data				
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_tried tried</td> </tr> </table>	flag values	flag_meanings	0, 1	not_tried tried	
flag values	flag_meanings								
0, 1	not_tried tried								
wfq2_fit2_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Fit standard; 1 = a second fit was tried for standard parameters.	Rel 34 GLAS Binary Data				
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_tried tried</td> </tr> </table>	flag values	flag_meanings	0, 1	not_tried tried	
flag values	flag_meanings								
0, 1	not_tried tried								
wfq_thres_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	First gate threshold; 1 = the shot has no signal because the first gate is above threshold.	Rel 34 GLAS Binary Data				
				<table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>in_bounds out_of_bounds</td> </tr> </table>	flag values	flag_meanings	0, 1	in_bounds out_of_bounds	
flag values	flag_meanings								
0, 1	in_bounds out_of_bounds								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
wfq_suspect_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Suspect fit; 1 = fit is suspect (narrow pulse or low signal to noise ratio). <table border="1" data-bbox="818 243 1430 380"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_suspect suspect</td> </tr> </table>	flag values	flag_meanings	0, 1	not_suspect suspect	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_suspect suspect								
wfq1_parm_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Alternate parameterization; 1 = alternate parameterization was used. <table border="1" data-bbox="818 474 1430 606"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_used used</td> </tr> </table>	flag values	flag_meanings	0, 1	not_used used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_used used								
wfq2_parm_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Standard parameterization; 1 = standard parameterization was used. <table border="1" data-bbox="818 701 1430 833"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_used used</td> </tr> </table>	flag values	flag_meanings	0, 1	not_used used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_used used								
wfq_pqn_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Compression; 0 = pqn type compression used, 1 = r type compression used <table border="1" data-bbox="818 957 1430 1089"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>pqn rtype</td> </tr> </table>	flag values	flag_meanings	0, 1	pqn rtype	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	pqn rtype								
wfq_amp_flg	INTEGER_1 (UNLIMITED)	Received Echo Quality Flag (NOT_SET)	NOT_SET	Raw amplitude; 1 = number of gates with raw amplitude of 255 is greater than i_min4clip (a variable in anc07_0004) <table border="1" data-bbox="818 1213 1430 1346"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_clipped clipped</td> </tr> </table>	flag values	flag_meanings	0, 1	not_clipped clipped	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_clipped clipped								
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. <table border="1" data-bbox="818 1497 1430 1629"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_used used</td> </tr> </table>	flag values	flag_meanings	0, 1	not_used used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_used used								
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. <table border="1" data-bbox="818 1780 1430 1913"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_used used</td> </tr> </table>	flag values	flag_meanings	0, 1	not_used used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_used used								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
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. <table border="1" data-bbox="818 300 1430 436"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_used used</td> </tr> </table>	flag values	flag_meanings	0, 1	not_used used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_used used								
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. <table border="1" data-bbox="818 583 1430 720"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_used used</td> </tr> </table>	flag values	flag_meanings	0, 1	not_used used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_used used								
elv_thres_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Threshold retracker; 1=Location of threshold retracker used to calculate elevation. <table border="1" data-bbox="818 840 1430 976"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_used used</td> </tr> </table>	flag values	flag_meanings	0, 1	not_used used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_used used								
elv_gauss_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Gaussian; 1=location associated with Gaussian with largest peak used to calculate elevation. <table border="1" data-bbox="818 1096 1430 1232"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_used used</td> </tr> </table>	flag values	flag_meanings	0, 1	not_used used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_used used								
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. <table border="1" data-bbox="818 1352 1430 1488"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>not_used used</td> </tr> </table>	flag values	flag_meanings	0, 1	not_used used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	not_used used								
elv_cloud_flg	INTEGER_1 (UNLIMITED)	Elevation Definition Flag (NOT_SET)	NOT_SET	Cloud contamination; 1 = Gain > flag value, indicating probable cloud contamination. <table border="1" data-bbox="818 1608 1430 1745"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>no_cloud cloud</td> </tr> </table>	flag values	flag_meanings	0, 1	no_cloud cloud	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	no_cloud cloud								
elev_use_flg	INTEGER_1 (UNLIMITED)	Elevation use flag (NOT_SET)	NOT_SET	Flag indicating whether the elevations on this record should be used (0=elevation is valid; 1=elevation is invalid). <table border="1" data-bbox="818 1864 1430 2001"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>valid not_valid</td> </tr> </table>	flag values	flag_meanings	0, 1	valid not_valid	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	valid not_valid								

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source				
att_pad_use_flg	INTEGER_1 (UNLIMITED)	Pad Use Flag (NOT_SET)	NOT_SET	PAD Use Flag: 1 = PAD used to determine spot location. <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>used not_used</td> </tr> </table>	flag values	flag_meanings	0, 1	used not_used	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	used not_used								
att_calc_pad_flg	INTEGER_1 (UNLIMITED)	Calc Pad Use Flag (NOT_SET)	NOT_SET	Calc PAD Use Flag; 0 = new PAD, 1 = pass-thru PAD was used to determine orbit. <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1</td> <td>new pass_thru</td> </tr> </table>	flag values	flag_meanings	0, 1	new pass_thru	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1	new pass_thru								
att_lpa_flg	INTEGER_1 (UNLIMITED)	LPA Problem Flag (NOT_SET)	NOT_SET	LPA Problem Flag; Indicates LPA quality : 0=good, 1=missing or 2=noisy. <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 1, 2</td> <td>good missing noisy</td> </tr> </table>	flag values	flag_meanings	0, 1, 2	good missing noisy	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 1, 2	good missing noisy								
sigma_att_flg	INTEGER_1 (UNLIMITED)	Attitude Quality Indicator (NOT_SET)	NOT_SET	Attitude quality indicator flag. <table border="1"> <tr> <td>flag values</td> <td>flag_meanings</td> </tr> <tr> <td>0, 50, 100, 127</td> <td>good warning bad not_valid</td> </tr> </table>	flag values	flag_meanings	0, 50, 100, 127	good warning bad not_valid	Rel 34 GLAS Binary Data
flag values	flag_meanings								
0, 50, 100, 127	good warning bad not_valid								
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>i_satNdxTh</i> (set in anc07_0004). The value 126 means 126 or more gates are above the saturation index threshold (<i>i_satNdxth</i>).	Rel 34 GLAS Binary Data				

Group: Data_40HZ/Transmit_Energy

This group contains the 40HZ transmit energy parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_maxTrAmp	DOUBLE (UNLIMITED)	Maximum Amp of Transmitted Pulse (NOT_SET)	volts	Maximum amplitude of transmitted pulse calculated from all (48) gates telemetered.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_sDevFitTr	DOUBLE (UNLIMITED)	Standard deviation of fit of transmitted pulse (NOT_SET)	volts	Standard deviation of fit of a gaussian model to the transmitted pulse.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_tpazimuth	DOUBLE (UNLIMITED)	Transmit pulse azimuth (NOT_SET)	deg	Transmit pulse azimuth. Angle eastwards from north of the major axis of the transmit pulse, as seen by the LPA. From ANC09.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_tpeccentricity	DOUBLE (UNLIMITED)	Transmit pulse eccentricity (NOT_SET)	e	Transmit pulse eccentricity as measured by the LPA. From ANC09.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_tpmajoraxis	DOUBLE (UNLIMITED)	Transmit pulse major axis (NOT_SET)	m	Transmit pulse major axis as measured by the LPA. From ANC09.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_tpaintensity	DOUBLE (UNLIMITED)	Transmit pulse intensity (NOT_SET)	counts	Transmit pulse intensity as measured by the LPA. >From ANC09.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_noiseTr	DOUBLE (UNLIMITED)	Noise estimate from the Gaussian fit to the transmitted pulse. (NOT_SET)	Volts	noise parameter from the gaussian fit to the transmitted pulse.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_ampTr	DOUBLE (UNLIMITED)	Amplitude estimate of the gaussian fit to the transmitted pulse. (NOT_SET)	Volts	amplitude parameter from the gaussian fit to the transmitted pulse	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_pklocTr	DOUBLE (UNLIMITED)	Peak location of the gaussian fit to the transmitted pulse. (NOT_SET)	ns	peak location (ns) Parameter from the Gaussian fit to the transmitted pulse. Peak location is relative to gate 1 of the transmit pulse.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_sigmaTr	DOUBLE (UNLIMITED)	Sigma of the Gaussian fit to the Transmitted Pulse (NOT_SET)	ns	sigma from the gaussian fit to the transmitted pulse.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_skewTr	DOUBLE (UNLIMITED)	Skewness of Transmitted Pulse (NOT_SET)	NOT_SET	Skewness of transmitted pulse.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_locTr	DOUBLE (UNLIMITED)	Centroid of transmitted pulse in time relative to gate 1 of transmit waveform. (NOT_SET)	ns	The time from gate 1 of the transmitted pulse to the centroid of transmitted pulse calculated from the 48 gates telemetered.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_tpCentX	DOUBLE (UNLIMITED)	LPA Centroid X (NOT_SET)	arcsec	X position of the centroid of the transmit pulse in the LPA, in arcsec from the left edge of the LPA (outer edge of pixel column 0). From ANC09.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_tpCentY	DOUBLE (UNLIMITED)	LPA Centroid Y (NOT_SET)	arcsec	Y position of the centroid of the transmit pulse in the LPA, in arcsec from the upper edge of the LPA (outer edge of pixel row 0). From ANC09.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_tpOrX	DOUBLE (UNLIMITED)	Pulse Orientation (NOT_SET)	degrees	Pulse Orientation (Angle measured counter-clockwise from LPA X-axis).	Rel 34 GLAS Binary Data	DS_UTCTime_40
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 34 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Reflectivity

This group contains the 40HZ Reflectivity parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_reflectuncmxpk	DOUBLE (UNLIMITED)	Reflectivity Not Corrected For Atmospheric Effects from max peak (NOT_SET)	NOT_SET	<p>Reflectivity, not corrected for atmospheric effects from max peak, is calculated as $Refl = R/T$, where R is the received energy from the maximum amplitude peak of the waveform after it has been scaled for range, and T is the transmitted energy. <code>i_reflectuncmxpk</code> 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 (<code>satindex</code> 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 = $i_reflectuncmxpk * (i_RecNrgAll + i_satNrgCorr)/i_RecNrgAll$)</p> <p>The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by <code>d_refiCor_atm</code>.</p>	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_reflectUncorr	DOUBLE (UNLIMITED)	Reflectivity not corrected for Atmospheric Effects (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_reflectUncorr 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 = $i_reflectUncorr * (i_RecNrgAll + i_satNrgCorr)/i_RecNrgAll$) The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by d_reflCor_atm .	Rel 34 GLAS Binary Data	DS_UTCTime_40
i_gval_rcv	INTEGER (UNLIMITED)	Gain value used for received pulse (NOT_SET)	counts	Gain value used for received pulse - uncalibrated.	Rel 34 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 34 GLAS Binary Data	DS_UTCTime_40
d_sDevNsOb2	DOUBLE (UNLIMITED)	Standard deviation of 1064 nm Background noise, (standard) (NOT_SET)	volts	The standard deviation of the background noise (standard parameters).	Rel 34 GLAS Binary Data	DS_UTCTime_40

Group: Data_40HZ/Waveform

This group contains the 40HZ Waveform parameters.

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_maxRecAmp	DOUBLE (UNLIMITED)	Max Amplitude of Received Echo (NOT_SET)	volts	Maximum amplitude of the received echo.	Rel 34 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 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
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 <code>d_recNrgAll_EU</code> and is not recomputed.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_RMSpulseWd	DOUBLE (UNLIMITED)	RMS Pulse Width (NOT_SET)	ns	The RMS width of the entire received waveform. See Eq 5 of ATBD for derivation of range.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_areaRecWF1	DOUBLE (UNLIMITED)	Area under received echo (alternate) (NOT_SET)	volts * ns	Area under the received echo from signal begin to signal end using alternate parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_skew1	DOUBLE (UNLIMITED)	Skewness of Received Echo (alternate) (NOT_SET)	NOT_SET	Skewness of the received echo from signal begin to signal end using alternate parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_kurt1	DOUBLE (UNLIMITED)	Kurtosis of Received Echo (alternate) (NOT_SET)	NOT_SET	Kurtosis of the received echo from signal begin to signal end using alternate parameters.	Rel 34 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 34 GLAS Binary Data	DS_UTCTime_40
d_wfFitSDev_1	DOUBLE (UNLIMITED)	The received echo fit standard deviation (alternate) (NOT_SET)	NOT_SET	The standard deviation of the difference between the functional fit and the received echo using alternate parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_wfnoiseOb1	DOUBLE (UNLIMITED)	1064 nm Background noise, (alternate) (NOT_SET)	volts	Either the background noise mean value measured by the instrument, or the background noise calculated from the received echo using alternate parameters. See flag definition for <code>1_WFqua1</code> - a flag is set if the background noise is calculated.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
i_numIters1	INTEGER (UNLIMITED)	Number of iterations performed during fit (alternate) (NOT_SET)	NOT_SET	This parameters contains the number of iterations for both the standard fit (shot,2), and the alternate fit (shot,1). These numbers are packed into forty bytes on the product: i_numIters(1) contains: bits 0-3: number of iterations for alternate fit for shot 1, bits 4-7: number of iterations for standard fit for shot 1 i_numIters(2) contains: bits 0-3: number of iterations for alternate fit for shot 2, bits 4-7: number of iterations for standard fit for shot 2 ... i_numIters(40) contains: bits 0-3: number of iterations for alternate fit for shot 40, bits 4-7: number of iterations for standard fit for shot 40	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_areaRecWF2	DOUBLE (UNLIMITED)	Area under received echo (standard) (NOT_SET)	volts * ns	Area under the received echo from signal begin to signal end using standard parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40
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 34 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 34 GLAS Binary Data	DS_UTCTime_40
i_nPeaks2	INTEGER (UNLIMITED)	Initial Number of Peaks in received echo (standard) (NOT_SET)	NOT_SET	The initial number of peaks found in the received echo; determined from the smoothed waveform, using standard parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_wfFitSDev_2	DOUBLE (UNLIMITED)	The received echo fit standard deviation (standard) (NOT_SET)	volts	The standard deviation of the difference between the functional fit and the received echo using the standard parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_wfnoiseOb2	DOUBLE (UNLIMITED)	1064 nm Background noise, (standard) (NOT_SET)	volts	Either the background noise mean value measured by the instrument, or the background noise calculated from the received echo using standard parameters. See flag definition for <code>1_WFqua1</code> - a flag is set if the background noise is calculated.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
i_numIters2	INTEGER (UNLIMITED)	Number of iterations performed during fit (standard) (NOT_SET)	NOT_SET	This parameter contains the number of iterations for both the standard fit (shot,2), and the alternate fit (shot,1). These numbers are packed into forty bytes on the product: i_numIters(1) contains: bits 0-3: number of iterations for alternate fit for shot 1, bits 4-7: number of iterations for standard fit for shot 1 i_numIters(2) contains: bits 0-3: number of iterations for alternate fit for shot 2, bits 4-7: number of iterations for standard fit for shot 2 ... i_numIters(40) contains: bits 0-3: number of iterations for alternate fit for shot 40, bits 4-7: number of iterations for standard fit for shot 40	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_noise1	DOUBLE (UNLIMITED)	Noise estimate from the Gaussian fit to the received echo (alternate) (NOT_SET)	Volts	Noise Parameter (in physical units) determined from the fit of the received echo using the alternate parameterization.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_amp1	DOUBLE (UNLIMITED, 6)	Amplitude estimate of the Gaussian fit to the received echo (alternate) (NOT_SET)	Volts	Amplitude Parameter (in physical units) determined from the fit of the received echo using the alternate parameterization for up to 6 peaks. nPeaks1 indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid. Adding the location to d_refRng gives the two-way range in time to the center of that peak.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_pkloc1	DOUBLE (UNLIMITED, 6)	Peak Location of the Gaussian fit to the received echo (alternate) (NOT_SET)	ns	Peak Location Parameter (in physical units) determined from the fit of the received echo using the alternate parameterization for up to 6 peaks. nPeaks1 indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid. Adding the location to d_refRng gives the two-way range in time to the center of that peak.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_simga1	DOUBLE (UNLIMITED, 6)	Sigma of the Gaussian fit to the received echo (alternate) (NOT_SET)	ns	Sigma of the Gaussian Parameter (in physical units) determined from the fit of the received echo using the alternate parameterization for up to 6 peaks. nPeaks1 indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid. Adding the location to d_refRng gives the two-way range in time to the center of that peak.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_centroid1	DOUBLE (UNLIMITED)	Centroid retracker offset (alternate) (NOT_SET)	ns	Offset to be added to d_refRng to give the two-way range in time to the location of the centroid of the received echo from signal begin through signal end defined by the alternate parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_minRngOff1	DOUBLE (UNLIMITED)	Minimum Range Offset (alternate) (NOT_SET)	ns	Offset to be added to d_refRng to give the two-way range in time to the location on the received echo calculated as the beginning of signal (closest to the spacecraft) using alternate parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_preRngOff1	DOUBLE (UNLIMITED)	Preliminary Uncorrected Range Offset (alternate) (NOT_SET)	ns	Offset to be added to d_refRng to give the two-way range in time to the location on the received echo calculated as the end of signal (farthest from the spacecraft) using alternate parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_solnnoiseSigmas1	DOUBLE (UNLIMITED)	Noise Sigmas of fit parameters (alternate) (NOT_SET)	Volts	Standard deviation of the noise fit parameter from the diagonal of the final covariance matrix using alternate parameterization.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_solnampSigmas1	DOUBLE (UNLIMITED, 6)	Amplitude Sigmas of fit parameters (alternate) (NOT_SET)	Volts	Standard deviation of the amplitude from the diagonal of the final covariance matrix using alternate parameterization. i_nPeaks1 indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_solnpklocSigmas1	DOUBLE (UNLIMITED, 6)	Peak Location Sigmas of fit parameters (alternate) (NOT_SET)	ns	Standard deviation of the peak location from the diagonal of the final covariance matrix using alternate parameterization. i_nPeaks1 indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_solnsigmaSigmas1	DOUBLE (UNLIMITED, 6)	Gaussian sigma (width) Sigmas of fit parameters (alternate) (NOT_SET)	ns	Standard deviation of the sigma (width) parameter from the diagonal of the final covariance matrix using alternate parameterization. <i>i_nPeaks1</i> indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_thRtkRngOff1	DOUBLE (UNLIMITED)	Threshold Retracker Range Offset (alternate) (NOT_SET)	ns	Offset to be added to <i>d_refRng</i> to give the two-way range in time to the threshold retracker location on the received echo calculated using alternate parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_noise2	DOUBLE (UNLIMITED)	Noise estimate from the Gaussian fit to the received echo (standard) (NOT_SET)	Volts	Noise Parameter (in physical units) determined from the fit of the received echo using the standard parameterization.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_amp2	DOUBLE (UNLIMITED, 6)	Amplitude estimate of the Gaussian fit to the received echo (standard) (NOT_SET)	Volts	Amplitude Parameter (in physical units) determined from the fit of the received echo using the standard parameterization for up to 6 peaks. <i>nPeaks2</i> indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid. Adding the location to <i>d_refRng</i> gives the two-way range in time to the center of that peak.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_pkloc2	DOUBLE (UNLIMITED, 6)	Peak Location of the Gaussian fit to the received echo (standard) (NOT_SET)	ns	Peak Location Parameter (in physical units) determined from the fit of the received echo using the standard parameterization for up to 6 peaks. nPeaks2 indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid. Adding the location to d_refRng gives the two-way range in time to the center of that peak.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_sigma2	DOUBLE (UNLIMITED, 6)	Sigma of the Gaussian fit to the received echo (standard) (NOT_SET)	ns	Sigma of the Gaussian Parameter (in physical units) determined from the fit of the received echo using the standard parameterization for up to 6 peaks. nPeaks2 indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid. Adding the location to d_refRng gives the two-way range in time to the center of that peak.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_centroid2	DOUBLE (UNLIMITED)	Centroid retracker offset (standard) (NOT_SET)	ns	Offset to be added to d_refRng to give the two-way range in time to the location of the centroid of the received echo from signal begin through signal end defined by the standard parameterization.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_minRngOff2	DOUBLE (UNLIMITED)	Minimum Range Offset (standard) (NOT_SET)	ns	Offset to be added to d_refRng to give the two-way range in time to the location on the received echo calculated as the beginning of signal (closest to the spacecraft) closest to the spacecraft using standard parameterization.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_preRngOff2	DOUBLE (UNLIMITED)	Preliminary Uncorrected Range Offset (standard) (NOT_SET)	ns	Offset to be added to d_refRng to give the two-way range in time to the location on the received echo calculated as the end of signal (farthest from the spacecraft) using standard parameterization.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_solnnoiseSigmas2	DOUBLE (UNLIMITED)	Noise Sigmas of fit parameters (standard) (NOT_SET)	Volts	Standard deviation of the noise fit parameter from the diagonal of the final covariance matrix using standard parameterization.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_solnampSigmas2	DOUBLE (UNLIMITED, 6)	Amplitude Sigmas of fit parameters (standard) (NOT_SET)	Volts	Standard deviation of the amplitude parameter from the diagonal of the final covariance matrix using standard parameterization. i_nPeaks2 indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_solnpklocSigmas2	DOUBLE (UNLIMITED, 6)	Peak Location Sigmas of fit parameters (standard) (NOT_SET)	ns	Standard deviation of the peak location parameter from the diagonal of the final covariance matrix using standard parameterization. i_nPeaks2 indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid.	Rel 34 GLAS Binary Data	DS_UTCTime_40

Label	Datatype (Dimensions)	long_name (standard_name)	units	description	source	coordinates
d_solnsigmaSigmas2	DOUBLE (UNLIMITED, 6)	Gaussian sigma (width) Sigmas of fit parameters (standard) (NOT_SET)	ns	Standard deviation of the sigma (width) parameter from the diagonal of the final covariance matrix using standard parameterization. <i>i_nPeaks2</i> indicates the number of peaks computed. The first element corresponds to the closest-to-the-ground or 1st peak. The second element corresponds to the next-to-last (2nd) peak. The last element corresponds to the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set to invalid.	Rel 34 GLAS Binary Data	DS_UTCTime_40
d_thRtkRngOff2	DOUBLE (UNLIMITED)	Threshold Retracker Range Offset (standard) (NOT_SET)	ns	Offset to be added to <i>d_refRng</i> to give the two-way range in time to the threshold retracker location on the received echo using standard parameters.	Rel 34 GLAS Binary Data	DS_UTCTime_40

/ANCILLARY_DATA

/ANCILLARY_DATA

Attribute	Example Value
glas_osc_rate	1.000000023
glas_osc_rate_date	2003-10-30
glas_osc_rate_time	00:00:00
sc_osc_rate	0.99999998854809
sc_osc_rate_date	2003-10-30
sc_osc_rate_time	00:00:00
internal_time_delay	0.0000151100
internal_time_delay_date	2003-10-30
internal_time_delay_time	00:00:00
internal_range_delay	9.5560
internal_range_delay_date	2003-10-30
internal_range_delay_time	00:00:00
Additional_Attribute	SP_ICE_PATH_NO, SP_ICE_GLAS_StartBlock, SP_ICE_GLAS_EndBlock, ReferenceOrbit, Track, Track_Segment, Cycle, Instance
bss_calib_min_time	122392298.3701589

Attribute	Example Value
bss_calib_max_time	122393578.3451884
bss_calib_factor	1.35, 1.3
bss_calib_time	120735000.0, 130326180.0
overall_calib_additive	0.
overall_calib_multiplier	0.862068965
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=CTL00_000_20140818_2614265_01_gla05_h5_convert.ct1

/METADATA/COLLECTIONMETADATA

Attribute	Example Value
DLLName	libDsESDTG1GLASPoly.001Sh.so
GranuleTimeDuration	1620
SpatialSearchType	Orbit
DataFileFormat	HDF5
ScienceMimeType	application/x-hdfeos
BrowseMimeType	application/x-hdfeos
BrowseOnlineMimeType	image/jpeg
ShortName	GLAH05
LongName	GLAS/ICESat L1B Global Waveform-based Range Corrections Data (HDF5)
CollectionDescription	The level 1B waveform parameterization data will contain waveform-based range corrections and surface characteristics at the full 40 per second resolution. Data granules will contain approximately 23 minutes (1/4 orbit) of data.
VersionID	34

Attribute	Example Value
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
Track	AdditionalAttributesContainer
Track_Segment	AdditionalAttributesContainer
Instrument_State	AdditionalAttributesContainer
ReferenceOrbit	AdditionalAttributesContainer
SP_ICE_PATH_NO	AdditionalAttributesContainer
SP_ICE_GLAS_StartBlock	AdditionalAttributesContainer
SP_ICE_GLAS_EndBlock	AdditionalAttributesContainer
Cycle	AdditionalAttributesContainer
Instance	AdditionalAttributesContainer
Instrument_State_Date	AdditionalAttributesContainer
Instrument_State_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 are 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 are a maximum of two per granule.
AdditionalAttributeName	Instrument_State_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
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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_Drift

Attribute	Example Value
AdditionalAttributeDatatype	float
AdditionalAttributeDescription	This is the ratio of the true time for a one second oscillator 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

Attribute	Example Value
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/DATA108

/METADATA/COLLECTIONMETADATA/AdditionalAttributes/identifier_product_doi_authority

Attribute	Example Value
AdditionalAttributeDatatype	varchar

Attribute	Example Value
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/10.5067/ICESAT/GLAS/DATA108

/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
GLAH06	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

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Attribute	Example Value
CollectionType	Input
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/GLAH06

Attribute	Example Value
CollectionType	Dependent
CollectionUse	Level 1B file containing: elevations, elevation corrections, surface roughness, reflectance, and associated timing and data quality information
ShortName	GLAH06
VersionID	34

/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	34

/METADATA/COLLECTIONMETADATA/CollectionAssociation/GLAH13

Attribute	Example Value
CollectionType	Dependent
CollectionUse	Level 2 file containing: Sea Ice Elevation, Reflectance, and Roughness, Ice Berg Elevations and Roughness. The product parameters are the result of product-specialized waveform fitting.
ShortName	GLAH13
VersionID	34

/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.

Attribute	Example Value
ShortName	GLAH14
VersionID	34

/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	34

/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

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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

Attribute	Example Value
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

Attribute	Example Value
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

Attribute	Example Value
ElectronicMailAddress	Jay.Zwally@nasa.gov

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters

Attribute	Example Value
Land_Surface	DisciplineTopicParametersContainer
Hydrosphere	DisciplineTopicParametersContainer
Cryosphere	DisciplineTopicParametersContainer

/METADATA/COLLECTIONMETADATA/DisciplineTopicParameters/Cryosphere

Attribute	Example Value
ECSDisciplineKeyword	Earth Science
ECSTopicKeyword	Cryosphere
ECSTermKeyword	Glaciers/Ice Sheets
ECSVariableKeyword	Glacier Elevation/Ice Sheet Elevation

/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	Topography
ECSVariableKeyword	Terrain Elevation

/METADATA/COLLECTIONMETADATA/ECSCollection

Attribute	Example Value
RevisionDate	2013-11-07

Attribute	Example Value
SuggestedUsage	GLAH05 contains scientific investigations of surface features defined by the waveform parameterization. File contains range corrections and the parameterizations of the waveform that were used to calculate surface elevation, and other surface characteristics. The data values were used as input data values to compute parameters on GLAH06 and GLAH12-15. Each GLAH05 file was created from an equivalent GLA05 binary formatted file. The provenance metadata shows the history that created the GLA05.
ProcessingCenter	GSFC I-SIPS
ArchiveCenter	NSIDC
VersionDescription	GLASHDF V2.0-Elevations for all products except GLAH14 are now based on the range from the Gaussian fit to the transmit pulse to the Gaussian fit to the received echo. Range used for trop corrections was changed from threshold to centroid.(See Rel Notes)
DatasetDisclaimerPointer	http://nsidc.org/data/icesat/disclaimer.html
ECSCollectionGuidePointer	https://nsidc.org/data/glah01-glah05-glah06-glah12-glah13-glah14-glah15/versions/1/documentation
ECSCollectionGuidePointerComment	Guide Document for this product at NSIDC
MiscellaneousInformationPointer	http://nsidc.org/data/icesat
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

Attribute	Example Value
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

Attribute	Example Value
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
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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/Review

Attribute	Example Value
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Attribute	Example Value
ScienceReviewDate	2001-03-04
ScienceReviewStatus	QA at DAACs
FutureReviewDate	2001-09-04

/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 1.4

Attribute	Example Value
ShortName	GLAH05
VersionID	34
RangeBeginningTime	01:51:38
RangeEndingTime	02:12:57
RangeBeginningDate	2003-11-18
RangeEndingDate	2003-11-18

/METADATA/INVENTORYMETADATA/ECSDDataGranule

Attribute	Example Value
ReprocessingPlanned	no further update anticipated
ReprocessingActual	reprocessed
LocalGranuleID	GLAH05_634_2103_002_0407_1_01_0001.H5
ProductionDateTime	2014-08-19T06:08:34
LocalVersionID	634

/METADATA/INVENTORYMETADATA/InputGranule

Attribute	Example Value
InputPointer	CTL00_000_20140818_2614265_01_gla05_h5_convert.ct1, tai-utc.dat, GLA05_634_2103_002_0407_1_01_0001.DAT, DsESDTG1GLAH05.034.desc

/METADATA/INVENTORYMETADATA/OrbitCalculatedSpatialDomain

Attribute	Example Value
OrbitNumber	4604
StartOrbitNumber	4604
StopOrbitNumber	4604
EquatorCrossingLongitude	-103.22287
EquatorCrossingTime	01:38:10
EquatorCrossingDate	2003-11-18

/METADATA/INVENTORYMETADATA/ProductSpecificMetadata

Attribute	Example Value
Track	407

Attribute	Example Value
Track_Segment	1
Instrument_State	373338
ReferenceOrbit	1
SP_ICE_PATH_NO	3429
SP_ICE_GLAS_StartBlock	NOT SET
SP_ICE_GLAS_EndBlock	NOT SET
Cycle	2
Instance	3
Instrument_State_Date	2003-10-30
Instrument_State_Time	00:00:00
identifier_product_doi	10.5067/ICESAT/GLAS/DATA108
identifier_file_uuid	2868de04-82ed-4282-94b3-24f078a309d8
identifier_product_doi_authority	http://dx.doi.org/10.5067/ICESAT/GLAS/DATA108

/METADATA/PROVENANCE

/METADATA/PROVENANCE/STEP_1

Attribute	Example Value
ProcessDateTime	2014-05-24T04:01:03

/METADATA/PROVENANCE/STEP_1/ProcessAgent

Attribute	Example Value
Name	glas_alt
Type	1B
Version	6.1
Description	This process is an instantiation of the GLAS Science Algorithm Software (GSAS) 1B ATBDs.

/METADATA/PROVENANCE/STEP_1/ProcessInput

Attribute	Example Value

/METADATA/PROVENANCE/STEP_2/ProcessOutput

Attribute	Example Value
Name	./GLAH05_634_2103_002_0407_1_01_0001.H5
Type	OUT_GLAH05
Version	1
UUID	2868de04-82ed-4282-94b3-24f078a309d8
DOI	10.5067/ICESAT/GLAS/DATA108

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