GEDI L4A Version 2 Product Data Dictionary

Dimension Variable	Description
MT	Number of shots
NV	Maximum number of variables
NC	Maximum number of coefficients
NE	Number of models

Group: /		
short_name	(Attribute)	GEDI_L4A
Group: /METADATA/DatasetIdentification		
abstract	(Attribute)	The GEDI L4A standard data product contains predictions of aboveground biomass density within each laser footprint.
characterSet	(Attribute)	utf8
creationDate	(Attribute)	File creation date
credit	(Attribute)	The software that generates the L4A product was implemented at the Department of Geographical Sciences at the University of Maryland (UMD), in collaboration with the GEDI Science Data Processing System at the NASA Goddard Space Flight Center (GSFC) in Greenbelt, Maryland and the Institute at Brown for Environment and Society at Brown University.
fileName	(Attribute)	Original file name
language	(Attribute)	eng
originatorOrganizationName	(Attribute)	GSFC GEDI-SDPS > GEDI Science Data Processing System and University of Maryland
PGEVersion	(Attribute)	Product generating executive SDPS release ID
purpose	(Attribute)	The purpose of the L4A dataset is to provide an estimate of aboveground biomass density from each GEDI waveform.
shortName	(Attribute)	GEDI_L4A
spatialRepresentationType	(Attribute)	along-track

status	(Attribute)	onGoing		
topicCategory	(Attribute)	geoscientificInformation		
uuid	(Attribute)	Universally unique identifier (UUID) for this file		
VersionID	(Attribute)	SDPS DAAC release ID		
gedi_l4a_githash	(Attribute)	Git commit hash of the gedi_l4a software used to create the L4A file		
Group: /BEAMXXXX				
Label	Datatype (Dimensions)	long_name	units source	description
agbd	FLOAT32 MT	Aboveground biomass density	Mg / ha	Aboveground biomass density (Mg / ha)
agbd_pi_lower	FLOAT32 MT	Aboveground biomass density lower prediction interval	Mg / ha	Lower prediction interval (see alpha attribute for the level)
agbd_pi_upper	FLOAT32 MT	Aboveground biomass density upper prediction interval	Mg / ha	Upper prediction interval (see alpha attribute for the level)
agbd_se	FLOAT32 MT	Aboveground biomass density prediction standard error	Mg / ha	Aboveground biomass density (Mg / ha) prediction standard error
agbd_t	FLOAT32 MT	Model prediction	-	Model prediction in fit units
agbd_t_se	FLOAT32 MT	Model prediction standard error	-	Model prediction standard error in fit units (needed for calculation of custom prediction intervals)
algorithm_run_flag	UINT8 MT	Algorithm run flag	-	The L4A algorithm is run if this flag is set to 1. This flag selects data which have sufficient waveform fidelity for AGBD estimation.
beam	UINT16 MT	Beam	- L2A	Beam identifier
channel	UINT8 MT	Channel	- L2A	Channel identifier
degrade_flag	UINT8 MT	Degrade flag	- L2A	Flag indicating degraded state of pointing and/or positioning information

delta_time	FLOAT64 MT	Delta time	s L2A	Time delta since Jan 1 00:00 2018.
elev_lowestmode	FLOAT32 MT	Elevation of the lowest mode	m L2A	Elevation of center of lowest mode relative to reference ellipsoid
l2_quality_flag	UINT8 MT	Level 2 quality flag	-	Flag identifying the most useful L2 data for biomass predictions
l4_quality_flag	UINT8 MT	Level 4 quality flag	-	Flag simplifying selection of most useful biomass predictions
lat_lowestmode	FLOAT64 MT	Latitude of the lowest mode	degrees L2A	Latitude of center of lowest mode
lon_lowestmode	FLOAT64 MT	Longitude of the lowest mode	degrees L2A	Longitude of center of lowest mode
master_frac	FLOAT64 MT	Fraction component of shot time	s L2A	Master time, fractional part. master_int+master_frac is equivalent to /BEAMXXXX/delta_time.
master_int	UINT32 MT	Integer component of shot time	s L2A	Master time, integer part. Seconds since master_time_epoch. master_int+master_frac is equivalent to /BEAMXXXX/delta_time.
predict_stratum	STR MT	Prediction stratum identifier	-	Character ID of the prediction stratum name for the 1 km cell
predictor_limit_flag	UINT8 MT	Predictor is outside the bounds of the training data	-	Predictor value is outside the bounds of the training data (0=In bounds; 1=Lower bound; 2=Upper bound)
response_limit_flag	UINT8 MT	Prediction is outside the bounds of the training data	-	Prediction value is outside the bounds of the training data (0=In bounds; 1=Lower bound; 2=Upper bound)
selected_algorithm	UINT8 MT	Selected algorithm setting group	- L2A	selected_algorithm
selected_mode	UINT8 MT	Selected mode	- L2A	ID of mode selected as lowest non-noise mode
selected_mode_flag	UINT8 MT	Selected mode flag	- L2A	Flag indicating status of selected_mode
sensitivity	FLOAT32 MT	Beam sensitivity	- L2A	Maxmimum canopy cover that can be penetrated considering the SNR of the waveform

shot_number	UINT64 MT	Shot number	- L2A	Shot number
solar_elevation	FLOAT32 MT	Solar elevation	degrees L2A	Solar elevation angle
surface_flag	UINT8 MT	Surface flag	- L2A	Indicates elev_lowestmode is within 300m of Digital Elevation Model (DEM) or Mean Sea Surface (MSS) elevation
xvar	FLOAT32 MT	Predictor variables	-	Predictor variables (offset and transformation have been applied)
Group: /BEAMXXXX/geolocation				
Label	Datatype (Dimensions)	long_name	units source	description
elev_lowestmode_aN	FLOAT32 MT	Elevation of the lowest mode	m L2A	Elevation of center of lowest mode relative to reference ellipsoid
lat_lowestmode_aN	FLOAT64 MT	Latitude of the lowest mode	degrees L2A	Latitude of center of lowest mode
lon_lowestmode_aN	FLOAT64 MT	Longitude of the lowest mode	degrees L2A	Longitude of center of lowest mode
sensitivity_aN	FLOAT32 MT	Beam sensitivity	- L2A	Maxmimum canopy cover that can be penetrated considering the SNR of the waveform
shot_number	UINT64 MT	Shot number	- L2A	Shot number
stale_return_flag	UINT8 MT	Stale return flag	- L2A	Flag from digitizer indicating the real-time pulse detection algorithm did not detect a return signal above its detection threshold within the entire 10 km search window. The pulse location of the previous shot was used to select the telemetered waveform.
Group: /BEAMXXXX/agbd_prediction				
pft_grid_version	(Attribute)	1 km Plant Functional Type grid version		
pft_infilled_grid_version	(Attribute)	1 km Plant Functional Type prediction strata grid version		
region_grid_version	(Attribute)	1 km geographic region prediction strata grid version		

phenology_grid_version	(Attribute)	1 km phenology metrics grid version		
urban_grid_version	(Attribute)	25 m urban proportion grid version		
water_grid_version	(Attribute)	25 m water persistence grid version		
predictor_offset	(Attribute)	Offset applied to predictors before model fitting		
response_offset	(Attribute)	Offset applied to the response before model fitting		
l2a_alg_count	(Attribute)	Number of L2A algorithm setting groups used for L4A		
max_nvar	(Attribute)	Maximum number of predictors in L4A models		
alpha	(Attribute)	Alpha value used for calculation of prediction intervals		
Label	Datatype (Dimensions)	long_name	units source	description
agbd_aN	FLOAT32 MT	Aboveground biomass density	Mg / ha	Aboveground biomass density
agbd_pi_lower_aN	FLOAT32 MT	Aboveground biomass density lower prediction interval	Mg / ha	Lower prediction interval (see alpha attribute for the level)
agbd_pi_upper_aN	FLOAT32 MT	Aboveground biomass density upper prediction interval	Mg / ha	Upper prediction interval (see alpha attribute for the level)
agbd_se_aN	FLOAT32 MT	Aboveground biomass density standard error	Mg / ha	Aboveground biomass density (Mg / ha) prediction standard error
agbd_t_aN	FLOAT32 MT	Aboveground biomass density in transform space	Mg / ha	Model prediction in transform space
agbd_t_pi_lower_aN	FLOAT32 MT	Lower prediction interval in transform space	Mg / ha	Lower prediction interval in transform space (see alpha attribute for the level)
agbd_t_pi_upper_aN	FLOAT32 MT	Upper prediction interval in transform space	Mg / ha	Upper prediction interval in transform space (see alpha attribute for the level)
agbd_t_se_aN	FLOAT32 MT	Model prediction standard error	-	Model prediction standard error in fit units (needed for calculation of custom prediction intervals)
algorithm_run_flag_aN	UINT8 MT	Algorithm run flag	-	The L4A algorithm is run if this flag is set to 1. This flag selects data which have sufficient waveform fidelity for AGBD estimation.

l2_quality_flag_aN	UINT8 MT	Level 2 quality flag	-	Flag identifying the most useful L2 data for biomass predictions
l4_quality_flag_aN	UINT8 MT	Level 4 quality flag	-	Flag simplifying selection of most useful biomass predictions
predictor_limit_flag_aN	UINT8 MT	Predictor is outside the bounds of the training data	-	Predictor value is outside the bounds of the training data
response_limit_flag_aN	UINT8 MT	Prediction is outside the bounds of the training data	-	Prediction value is outside the bounds of the training data
selected_mode_aN	UINT8 MT	Selected mode	- L2A	ID of mode selected as lowest non-noise mode
selected_mode_flag_aN	UINT8 MT	Selected mode flag	- L2A	Flag indicating status of selected_mode
shot_number	UINT64 MT	Shot number	- L2A	Shot number
xvar_aN	FLOAT32 MT	Predictor variables	-	Predictor variables (offset and transformation have been applied)
Group: /BEAMXXXX/land_cover_data				
Label	Datatype (Dimensions)	long_name	units source	description
landsat_treecover	FLOAT64 MT	Landsat tree canopy cover	percent L2A	Tree cover in the year 2010, defined as canopy closure for all vegetation taller than 5m in height (Hansen et al.). Encoded as a percentage per output grid cell.
landsat_water_persistence	UINT8 MT	25 m Landsat water persistence	percent	The percent UMD GLAD Landsat observations with classified surface water between 2018 and 2019. Values > 80 usually represent permanent water while values < 10 represent permanent land.
leaf_off_doy	INT16	1 km VIIRS leaf-off day-of-year	days	GEDI 1 km EASE 2.0 grid leaf-off start day-of-year derived from the NPP VIIRS Global Land Surface Phenology Product.
leaf_off_flag	UINT8 MT	1 km VIIRS leaf-off flag	-	GEDI 1 km EASE 2.0 grid flag derived from leaf_off_doy, leaf_on_doy and pft_class, indicating if the observation was recorded during leaf-off conditions in deciduous needleleaf or broadleaf forests and woodlands. 1 = leaf-off and 0 = leaf-on.

leaf_on_cycle	UINT8	1 km VIIRS leaf-on cycle number	-	Flag that indicates the vegetation growing cycle for leaf-on observations. Values are 0 (leaf-off conditions), 1 (cycle 1) or 2 (cycle 2).
leaf_on_doy	INT16	1 km VIIRS leaf-on day-of-year	-	GEDI 1 km EASE 2.0 grid leaf-on start day-of-year derived from the NPP VIIRS Global Land Surface Phenology Product.
pft_class	UINT8	1 km MODIS Plant Functional Type class	-	GEDI 1 km EASE 2.0 grid Plant Functional Type (PFT) derived from the MODIS MCD12Q1v006 Product. Values follow the Land Cover Type 5 Classification scheme.
region_class	UINT8 MT	1 km geographic region class	-	GEDI 1 km EASE 2.0 grid world continental regions (0: Water, 1: Europe, 2: North Asia, 3: Australasia, 4: Africa, 5: South Asia, 6: South America, 7: North America).
shot_number	UINT64 MT	Shot number	- L2A	Shot number
urban_focal_window_size	UINT8 MT	Urban focal window size	pixels	The focal window size used to calculate urban_proportion. Values are 3 (3x3 pixel window size) or 5 (5x5 pixel window size).
urban_proportion	UINT8 MT	25 m TDX urban percentage	percent	The percentage proportion of land area within a focal area surrounding each shot that is urban land cover. Urban land cover is derived from the DLR 12 m resolution TanDEM-X Global Urban Footprint Product.
Compound dataset: /ANCILLARY/model_data				
Label	Datatype (Dimensions)	long_name	units source	description
predict_stratum	STR NE	Prediction stratum	-	Prediction stratum (e.g., DBT_Af = Deciduous Broadleaf Tree, Africa)
model_group	UINT8 NE	Model group	-	Model group (1 = All predictors considered; 2 = No RH metrics below RH50; 3 = Forced inclusion of RH98; 4 = Forced inclusion of RH98 and no RH metrics below RH50)
model_name	STR NE	Model name	-	Model name (prediction stratum used for the fit data)
model_id	UINT8 NE	Model ID	-	Model rank used for the prediction stratum

bias_correction_name	STR NE	Bias correction name	-	Back-transform bias correction method (Snowdon, Baskerville)
bias_correction_value	FLOAT32 NE	Bias correction value	-	Back-transform bias correction value
dof	UINT32 NE	Degrees of freedom	-	Degrees of freedom
fit_stratum	STR NE	Fit stratum	-	Fit stratum
par	FLOAT64 NE,NC	Model parameters	-	Model parameters (coefficients)
npar	UINT8 NE	Number of model parameters	-	Number of model parameters (coefficients)
predictor_id	UINT8 NE,NV	Predictor identifier	-	Predictor identifier
predictor_max_value	FLOAT32 NE,NV	Predictor maximum value	-	Maximum value of predictor in transform space used to train the model
response_max_value	FLOAT32 NE	Response maximum value	Mg / ha -	Maximum value of Mg/ha used to train the model
rh_index	UINT8 NE,NV	RH index	-	Index of RH metric to use as a predictor
rse	FLOAT32 NE	Residual Standard Error	-	Residual Standard Error
vcov	FLOAT64 NE,NC,NC	Variance-covariance matrix	-	Variance-covariance matrix of model parameters
x_transform	STR NE	X transform	-	Predictor transform (sqrt, log, None)
y_transform	STR NE	Y transform	-	Response transform (sqrt, log)
Compound dataset: /ANCILLARY/pft_lut				

Label	Datatype (Dimensions)	long_name	units source	description
pft_class	UINT8 7	PFT class	-	MCD12Q1 Type 5 class (Plant Functional Type)
pft_name	STR 7	PFT name	-	L4A Plant Functional Type strata
Compound dataset: /ANCILLARY/region_lut				
Label	Datatype (Dimensions)	long_name	units source	description
region_class	UINT8 7	Region class	-	L4A geographical region identifier
region_name	STR 7	Region name	-	L4A geographical region strata