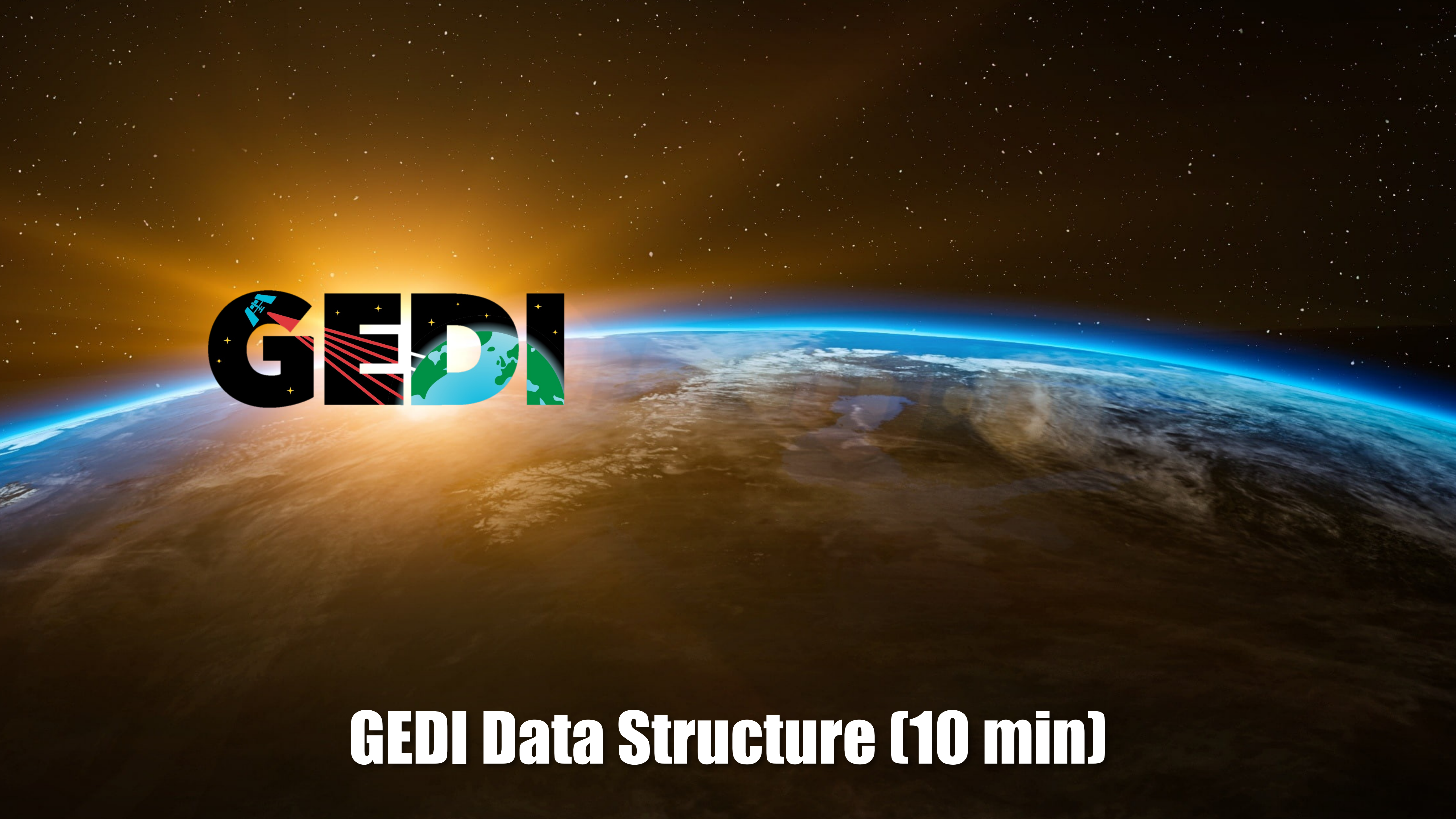
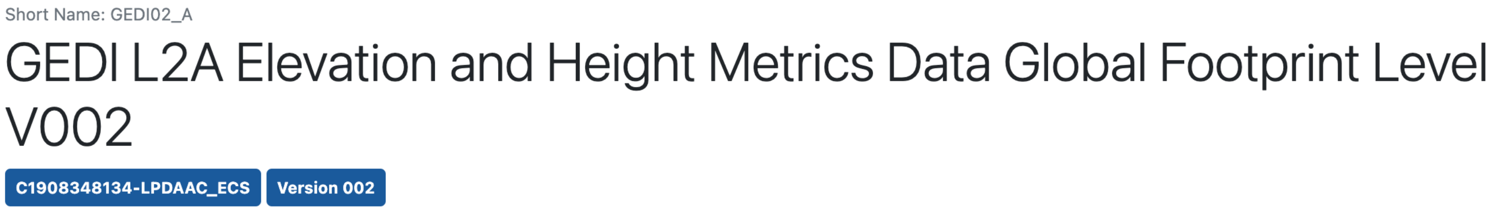


GEDI Data Structure (10 min)

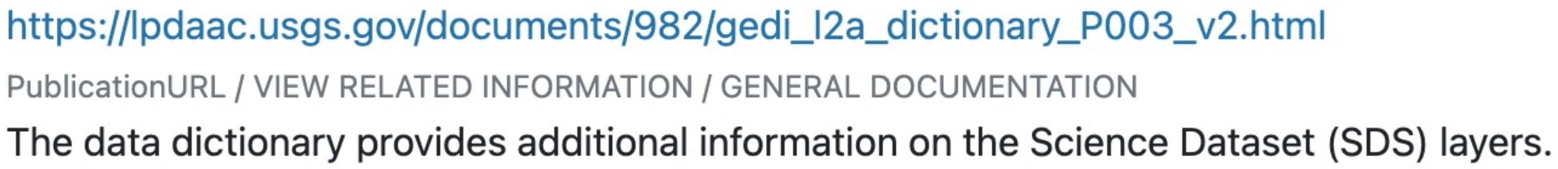
Footprint Data

- Search “GEDI l2a data dictionary”



Short Name: GEDI02_A

GEDI L2A Elevation and Height Metrics Data Global Footprint Level V002



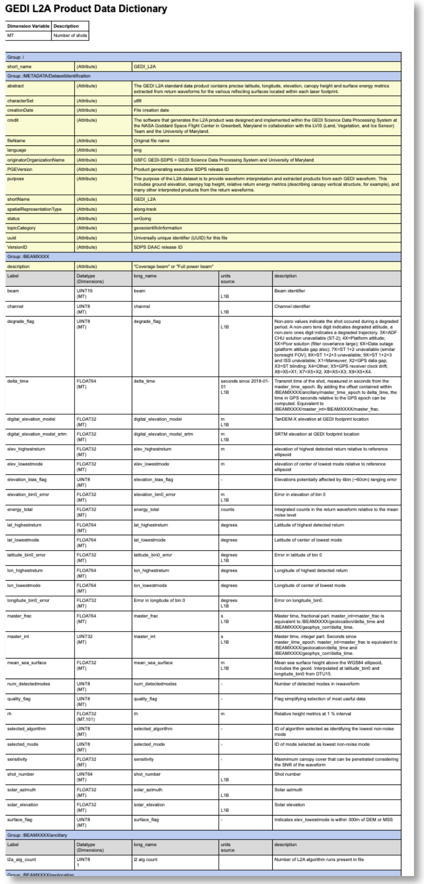
https://lpdaac.usgs.gov/documents/982/gedi_l2a_dictionary_P003_v2.html

PublicationURL / VIEW RELATED INFORMATION / GENERAL DOCUMENTATION

The data dictionary provides additional information on the Science Dataset (SDS) layers.

Footprint Data

- Open data dictionary for the entire GEDI L2A Data Structure

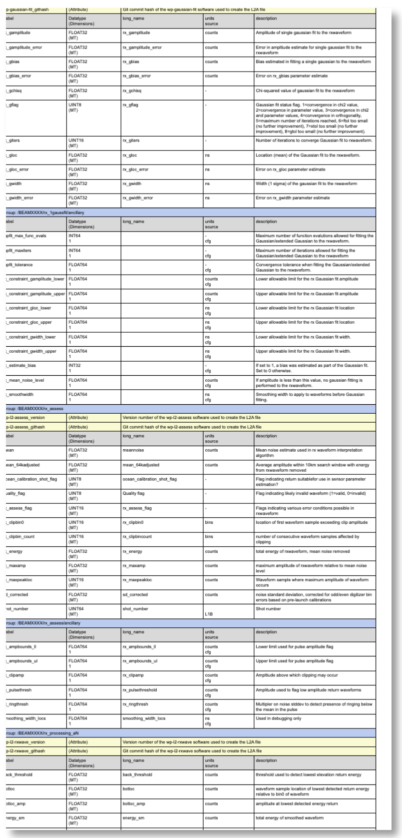


GEDI L2A Product Data Dictionary

Dimension Variable	Description
MT	Number of shots

Group: /				
short_name	(Attribute)	GEDI_L2A		
Group: /METADATA/DatasetIdentification				
abstract	(Attribute)	The GEDI L2A standard data product contains precise latitude, longitude, elevation, canopy height and surface energy metrics extracted from return waveforms for the various reflecting surfaces located within each laser footprint.		
characterSet	(Attribute)	utf8		
creationDate	(Attribute)	File creation date		
credit	(Attribute)	The software that generates the L2A product was designed and implemented within the GEDI Science Data Processing System at the NASA Goddard Space Flight Center in Greenbelt, Maryland in collaboration with the LVIS (Land, Vegetation, and Ice Sensor) Team and the University of Maryland.		
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 L2A dataset is to provide waveform interpretation and extracted products from each GEDI waveform. This includes ground elevation, canopy top height, relative return energy metrics (describing canopy vertical structure, for example), and many other interpreted products from the return waveforms.		
shortName	(Attribute)	GEDI_L2A		
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		
Group: /BEAMXXXX				
description	(Attribute)	"Coverage beam" or "Full power beam"		
Label	Datatype (Dimensions)	long_name	units source	description
beam	UINT16 (MT)	beam	L1B	Beam identifier
channel	UINT8 (MT)	channel	L1B	Channel identifier
degrade_flag	UINT8 (MT)	degrade_flag	L1B	Non-zero values indicate the shot occured during a degraded period. A non-zero tens digit indicates degraded attitude, a non-zero ones digit indicates a degraded trajectory. 3X=ADF CHU solution unavailable (ST-2); 4X=Platform attitude; 5X=Poor solution (filter covariance large); 6X=Data outage (platform attitude gap also); 7X=ST 1+2 unavailable (similar boresight FOV); 8X=ST 1+2+3 unavailable; 9X=ST 1+2+3 and ISS unavailable; X1=Maneuver; X2=GPS data gap; X3=ST blinding; X4=Other; X5=GPS receiver clock drift; X6=X5+X1; X7=X5+X2; X8=X5+X3; X9=X5+X4.
delta_time	FLOAT64 (MT)	delta_time	seconds since 2018-01-01 L1B	Transmit time of the shot, measured in seconds from the master_time_epoch. By adding the offset contained within /BEAMXXXX/ancillary/master_time_epoch to delta_time, the time in GPS seconds relative to the GPS epoch can be computed. Equivalent to /BEAMXXXX/master_int+/BEAMXXXX/master_frac.
digital_elevation_model	FLOAT32 (MT)	digital_elevation_model	m L1B	TanDEM-X elevation at GEDI footprint location
digital_elevation_model_srtm	FLOAT32 (MT)	digital_elevation_model_srtm	m L1B	SRTM elevation at GEDI footprint location
elev_highestreturn	FLOAT32 (MT)	elev_highestreturn	m	elevation of highest detected return relative to reference ellipsoid
elev_lowestmode	FLOAT32 (MT)	elev_lowestmode	m	elevation of center of lowest mode relative to reference ellipsoid
elevation_bias_flag	UINT8 (MT)	elevation_bias_flag	-	Elevations potentially affected by 4bin (~60cm) ranging error
elevation_bin0_error	FLOAT32 (MT)	elevation_bin0_error	m L1B	Error in elevation of bin 0
energy_total	FLOAT32 (MT)	energy_total	counts	Integrated counts in the return waveform relative to the mean noise level
lat_highestreturn	FLOAT64 (MT)	lat_highestreturn	degrees	Latitude of highest detected return
lat_lowestmode	FLOAT64 (MT)	lat_lowestmode	degrees	Latitude of center of lowest mode
latitude_bin0_error	FLOAT32 (MT)	latitude_bin0_error	degrees L1B	Error in latitude of bin 0
lon_highestreturn	FLOAT64 (MT)	lon_highestreturn	degrees	Longitude of highest detected return
lon_lowestmode	FLOAT64 (MT)	lon_lowestmode	degrees	Longitude of center of lowest mode
longitude_bin0_error	FLOAT32 (MT)	Error in longitude of bin 0	degrees L1B	Error on longitude_bin0.
master_frac	FLOAT64 (MT)	master_frac	s L1B	Master time, fractional part. master_int+master_frac is equivalent to /BEAMXXXX/geolocation/delta_time and /BEAMXXXX/geophys_corr/delta_time.
master_int	UINT32 (MT)	master_int	s L1B	Master time, integer part. Seconds since master_time_epoch. master_int+master_frac is equivalent to /BEAMXXXX/geolocation/delta_time and /BEAMXXXX/geophys_corr/delta_time.
mean_sea_surface	FLOAT32 (MT)	mean_sea_surface	m L1B	Mean sea surface height above the WGS84 ellipsoid, includes the geoid. Interpolated at latitude_bin0 and longitude_bin0 from DTU15.
num_detectedmodes	UINT8 (MT)	num_detectedmodes	-	Number of detected modes in rxwaveform
quality_flag	UINT8 (MT)	quality_flag	-	Flag simplifying selection of most useful data
rh	FLOAT32 (MT,101)	rh	m	Relative height metrics at 1 % interval
selected_algorithm	UINT8 (MT)	selected_algorithm	-	ID of algorithm selected as identifying the lowest non-noise mode
selected_mode	UINT8 (MT)	selected_mode	-	ID of mode selected as lowest non-noise mode
sensitivity	FLOAT32 (MT)	sensitivity	-	Maxmimum canopy cover that can be penetrated considering the SNR of the waveform
shot_number	UINT64 (MT)	shot_number	L1B	Shot number
solar_azimuth	FLOAT32 (MT)	solar_azimuth	L1B	Solar azimuth
solar_elevation	FLOAT32 (MT)	solar_elevation	L1B	Solar elevation
surface_flag	UINT8 (MT)	surface_flag	-	Indicates elev_lowestmode is within 300m of DEM or MSS
Group: /BEAMXXXX/ancillary				
Label	Datatype (Dimensions)	long_name	units source	description
l2a_alg_count	UINT8 1	l2 alg count		Number of L2A algorithm runs present in file
Group: /BEAMXXXX/geolocation				

Group: /BEAMXXXX/geolocation				
Label	Datatype (Dimensions)	long_name	units source	description
elev_highestreturn_aN	FLOAT32 (MT)	elev_highestreturn_aN	m	Elevation of the highest return detected using algorithm N, relative to reference ellipsoid
elev_lowestmode_aN	FLOAT32 (MT)	elev_lowestmode_aN	m	Elevation of the center of the lowest mode detected using algorithm N,relative to reference ellipsoid
elev_lowestreturn_aN	FLOAT32 (MT)	elev_lowestreturn_aN	m	Elevation of lowest return detected using algorithm N,relative to reference ellipsoid
elevation_1gfit	FLOAT32 (MT)	elevation_gaussfit_aN	m	Elevation corresponding to the center of a single gaussian fit to the waveform, relative to reference ellipsoid
elevs_allmodes_aN	FLOAT32 (MT,rx_max_mode_count)	elevs_allmodes_aN	m	Elevations of all modes detected using algorithm N, relative to reference ellipsoid
energy_lowestmode_aN	FLOAT32 (MT)	energy_lowestmode_aN	counts	Energy of lowest mode, detected using algorithm N, in the waveform above the mean noise level
lat_highestreturn_aN	FLOAT64 (MT)	lat_highestreturn_aN	degrees	Latitude of the highest return detected using algorithm N
lat_lowestmode_aN	FLOAT64 (MT)	lat_lowestmode_aN	degrees	Latitude of the center of the lowest mode detected using algorithm N
lat_lowestreturn_aN	FLOAT64 (MT)	lat_lowestreturn__aN	degrees	Latitude of the lowest return detected using algorithm N
latitude_1gfit	FLOAT64 (MT)	latitude_gaussfit_aN	degrees	Latitude corresponding to the center of a single gaussian fit to the waveform
lats_allmodes_aN	FLOAT64 (MT,rx_max_mode_count)	lats_allmodes_aN	degrees	Latitudes of all modes detected using algorithm N
lon_highestreturn_aN	FLOAT64 (MT)	lon_highestreturn_aN	degrees	Longitude of the highest return detected using algorithm N
lon_lowestmode_aN	FLOAT64 (MT)	lon_lowestmode_aN	degrees	Longitude of the center of lowest mode detected using algorithm N
lon_lowestreturn_aN	FLOAT64 (MT)	lon_lowestreturn_aN	degrees	Longitude of lowest return detected using algorithmN
longitude_1gfit	FLOAT64 (MT)	longitude_gaussfit_aN	degrees	Longitude corresponding to the center of a single gaussian fit to the waveform
lons_allmodes_aN	FLOAT64 (MT,rx_max_mode_count)	lons_allmodes_aN	degrees	Longitudes of all modes detected using algorithmN
num_detectedmodes_aN	UINT8 (MT)	num_detectedmodes_aN	-	Number of detected modes detected using algorithm N
quality_flag_aN	UINT8 (MT)	quality_flag_aN	-	Flag simplifying selection of most useful data
rh_aN	INT16 (MT,101)	rh_aN	cm	Relative height metrics at 1 % intervals using algorithm N (in cm)
sensitivity_aN	FLOAT32 (MT)	sensitivity_aN	-	Maxmimum canopy cover, using algorithmN, that can be penetrated considering the SNR of the waveform
shot_number	UINT64 (MT)	shot_number	L1B	Shot number
stale_return_flag	UINT8 (MT)	stale_return_flag	- L1B	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/land_cover_data				
Label	Datatype (Dimensions)	long_name	units source	description
landsat_treecover	FLOAT64 (MT)	Landsat tree canopy cover	percent Derived from treecover2010_v3 geotiff tiles	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)	Landsat water persistence	- Derived	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_flag	UINT8 (MT)	Leaf off flag	- Derived	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 forests and woodlands. 1 = leaf-off and 0 = leaf-on.
leaf_off_doy	INT16 (MT)	Leaf off day of year	- Derived	GEDI 1 km EASE 2.0 grid leaf-off start day-of-year derived from the NPP VIIRS Global Land Surface Phenology Product.
leaf_on_doy	INT16 (MT)	Leaf on day of year	- Derived	GEDI 1 km EASE 2.0 grid leaf-on start day-of-year derived from the NPP VIIRS Global Land Surface Phenology Product.
leaf_on_cycle	UINT8 (MT)	Leaf on cycle	- Derived	Flag that indicates the vegetation growing cycle for leaf-on observations. Values are 0 (leaf-off conditions), 1 (cycle 1) or 2 (cycle 2).
modis_nonvegetated	FLOAT64 (MT)	MODIS non-vegetated	percent Derived from MODIS geotiff tiles	Percent non-vegetated from MODIS data. Interpolated at latitude_bin0 and longitude_bin0. doi:10.5067/MODIS/MOD44B.006
modis_nonvegetated_sd	FLOAT64 (MT)	MODIS non-vegetated standard deviation	percent Derived from MODIS geotiff tiles	Percent non-vegetated standard deviation from MODIS data. Interpolated at latitude_bin0 and longitude_bin0. doi:10.5067/MODIS/MOD44B.006
modis_treecover	FLOAT64 (MT)	MODIS tree cover	percent Derived from MODIS geotiff tiles	Percent tree cover from MODIS data. Interpolated at latitude_bin0 and longitude_bin0. doi:10.5067/MODIS/MOD44B.006
modis_treecover_sd	FLOAT64 (MT)	MODIS tree cover standard deviation	percent Derived from MODIS geotiff tiles	Percent tree cover standard deviation from MODIS data. Interpolated at latitude_bin0 and longitude_bin0. doi:10.5067/MODIS/MOD44B.006
pft_class	UINT8 (MT)	Plant functional type class	- Derived	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)	Region class	- Derived	GEDI 1 km EASE 2.0 grid world continental regions (0: Water, 1: Europe, 2: North Asia, 5: South Asia, 3: Australasia, 4: Africa, 6: South America, 7: North America).
urban_focal_window_size	UINT8 (MT)	Urban focal window size	- Derived	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)	Urban proportion	- Derived	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.
Group: /BEAMXXXX/rx_1gaussfit				
wp-gaussian-fit_version	(Attribute)	Version number of the wp-gaussian-fit software used to create the L2A file		
wp-gaussian-fit_githash	(Attribute)	Git commit hash of the wp-gaussian-fit software used to create the L2A file		
Label	Datatype (Dimensions)	long_name	units source	description
rx_gamplitude	FLOAT32 (MT)	rx_gamplitude	counts	Amplitude of single gaussian fit to the rxwaveform
rx_gamplitude_error	FLOAT32 (MT)	rx_gamplitude_error	counts	Error in amplitude estimate for single gaussian fit to the rxwaveform
rx_gbias	FLOAT32 (MT)	rx_gbias	counts	Bias estimated in fitting a single gaussian to the rxwaveform
rx_gbias_error	FLOAT32 (MT)	rx_gbias_error	counts	Error on rx_gbias parameter estimate



p-gaussian-fit_githash	(Attribute)	Git commit hash of the wp-gaussian-fit software used to create the L2A file		
abel	Datatype (Dimensions)	long_name	units source	description
_gamplitude	FLOAT32 (MT)	rx_gamplitude	counts	Amplitude of single gaussian fit to the rxwaveform
_gamplitude_error	FLOAT32 (MT)	rx_gamplitude_error	counts	Error in amplitude estimate for single gaussian fit to the rxwaveform
_gbias	FLOAT32 (MT)	rx_gbias	counts	Bias estimated in fitting a single gaussian to the rxwaveform
_gbias_error	FLOAT32 (MT)	rx_gbias_error	counts	Error on rx_gbias parameter estimate
_gchisq	FLOAT32 (MT)	rx_gchisq	-	Chi-squared value of gaussian fit to the rxwaveform
_gflag	UINT8 (MT)	rx_gflag	-	Gaussian fit status flag. 1=convergence in chi2 value, 2=convergence in parameter value, 3=convergence in chi2 and parameter values, 4=convergence in orthogonality, 5=maximum number of iterations reached, 6=ftol too small (no further improvement), 7=xtol too small (no further improvement), 8=gtol too small (no further improvement).
_giters	UINT16 (MT)	rx_giters	-	Number of iterations to converge Gaussian fit to rxwaveform.
_gloc	FLOAT32 (MT)	rx_gloc	ns	Location (mean) of the Gaussian fit to the rxwaveform.
_gloc_error	FLOAT32 (MT)	rx_gloc_error	ns	Error on rx_gloc parameter estimate
_gwidth	FLOAT32 (MT)	rx_gwidth	ns	Width (1 sigma) of the gaussian fit to the rxwaveform
_gwidth_error	FLOAT32 (MT)	rx_gwidth_error	ns	Error on rx_gwidth parameter estimate
roup: /BEAMXXXX/rx_1gaussfit/ancillary				
abel	Datatype (Dimensions)	long_name	units source	description
pfit_max_func_evals	INT64 1		- cfg	Maximum number of function evalutions allowed for fitting the Gaussian/extended Gaussian to the rxwaveform.
pfit_maxiters	INT64 1		- cfg	Maximum number of iterations allowed for fitting the Gaussian/extended Gaussian to the rxwaveform
pfit_tolerance	FLOAT64 1		- cfg	Convergence tolerance when fitting the Gaussian/extended Gaussian to the rxwaveform.
_constraint_gamplitude_lower	FLOAT64 1		counts cfg	Lower allowable limit for the rx Gaussian fit amplitude
_constraint_gamplitude_upper	FLOAT64 1		counts cfg	Upper allowable limit for the rx Gaussian fit amplitude
_constraint_gloc_lower	FLOAT64 1		ns cfg	Lower allowable limit for the rx Gaussian fit location
_constraint_gloc_upper	FLOAT64 1		ns cfg	Upper allowable limit for the rx Gaussian fit location
_constraint_gwidth_lower	FLOAT64 1		ns cfg	Lower allowable limit for the rx Gaussian fit width.
_constraint_gwidth_upper	FLOAT64 1		ns cfg	Upper allowable limit for the rx Gaussian fit width.
_estimate_bias	INT32 1		- cfg	If set to 1, a bias was estimated as part of the Gaussian fit. Set to 0 otherwise.
_mean_noise_level	FLOAT64 1		counts cfg	If amplitude is less than this value, no gaussian fitting is performed to the rxwaveform.
_smoothwidth	FLOAT64 1		ns cfg	Smoothing width to apply to waveforms before Gaussian fitting.
roup: /BEAMXXXX/rx_assess				
p-l2-assess_version	(Attribute)	Version number of the wp-l2-assess software used to create the L2A file		
p-l2-assess_githash	(Attribute)	Git commit hash of the wp-l2-assess software used to create the L2A file		
abel	Datatype (Dimensions)	long_name	units source	description
ean	FLOAT32 (MT)	meannoise	counts	Mean noise estimate used in rx waveform interpretation algorithm
ean_64kadjusted	FLOAT32 (MT)	mean_64kadjusted	counts	Average amplitude within 10km search window with energy from rxwaveform removed
cean_calibration_shot_flag	UINT8 (MT)	ocean_calibration_shot_flag	-	Flag indicating return suitablefor use in sensor parameter estimation?
uality_flag	UINT8 (MT)	Quality flag	-	Flag indicating likely invalid waveform (1=valid, 0=invalid)
_assess_flag	UINT16 (MT)	rx_assess_flag	-	Flags indicating various error conditions possible in rxwaveform
_clipbin0	UINT16 (MT)	rx_clipbin0	bins	location of first waveform sample exceeding clip amplitude
_clipbin_count	UINT16 (MT)	rx_clipbincount	bins	number of consecutive waveform samples affected by clipping
_energy	FLOAT32 (MT)	rx_energy	counts	total energy of rxwaveform, mean noise removed
_maxamp	FLOAT32 (MT)	rx_maxamp	counts	maximum amplitude of rxwaveform relative to mean noise level
_maxpeakloc	UINT16 (MT)	rx_maxpeakloc	counts	Waveform sample where maximum amplitude of waveform occurs
d_corrected	FLOAT32 (MT)	sd_corrected	counts	noise standard deviation, corrected for odd/even digitizer bin errors based on pre-launch calibrations
hot_number	UINT64 (MT)	shot_number	L1B	Shot number
roup: /BEAMXXXX/rx_assess/ancillary				
abel	Datatype (Dimensions)	long_name	units source	description
_ampbounds_ll	FLOAT64 1	rx_ampbounds_ll	counts cfg	Lower limit used for pulse amplitude flag
_ampbounds_ul	FLOAT64 1	rx_ampbounds_ul	counts cfg	Upper limit used for pulse amplitude flag
_clipamp	FLOAT64 1	rx_clipamp	counts cfg	Amplitude above which clipping may occur
_pulsethresh	FLOAT64 1	rx_pulsethreshold	counts cfg	Amplitude used to flag low amplitude return waveforms
_ringthresh	FLOAT64 1	rx_ringthresh	counts cfg	Multipler on noise stddev to detect presence of ringing below the mean in the pulse
moothing_width_locs	FLOAT64 1	smoothing_width_locs	ns cfg	Used in debugging only
roup: /BEAMXXXX/rx_processing_aN				
p-l2-rxwave_version	(Attribute)	Version number of the wp-l2-rxwave software used to create the L2A file		
p-l2-rxwave_githash	(Attribute)	Git commit hash of the wp-l2-rxwave software used to create the L2A file		
abel	Datatype (Dimensions)	long_name	units source	description
ack_threshold	FLOAT32 (MT)	back_threshold	counts	threshold used to detect lowest elevation return energy
otloc	FLOAT32 (MT)	botloc	counts	waveform sample location of lowest detected return energy relative to bin0 of waveform
otloc_amp	FLOAT32 (MT)	botloc_amp	counts	amplitude at lowest detected energy return
nergy_sm	FLOAT32 (MT)	energy_sm	counts	total energy of smoothed waveform

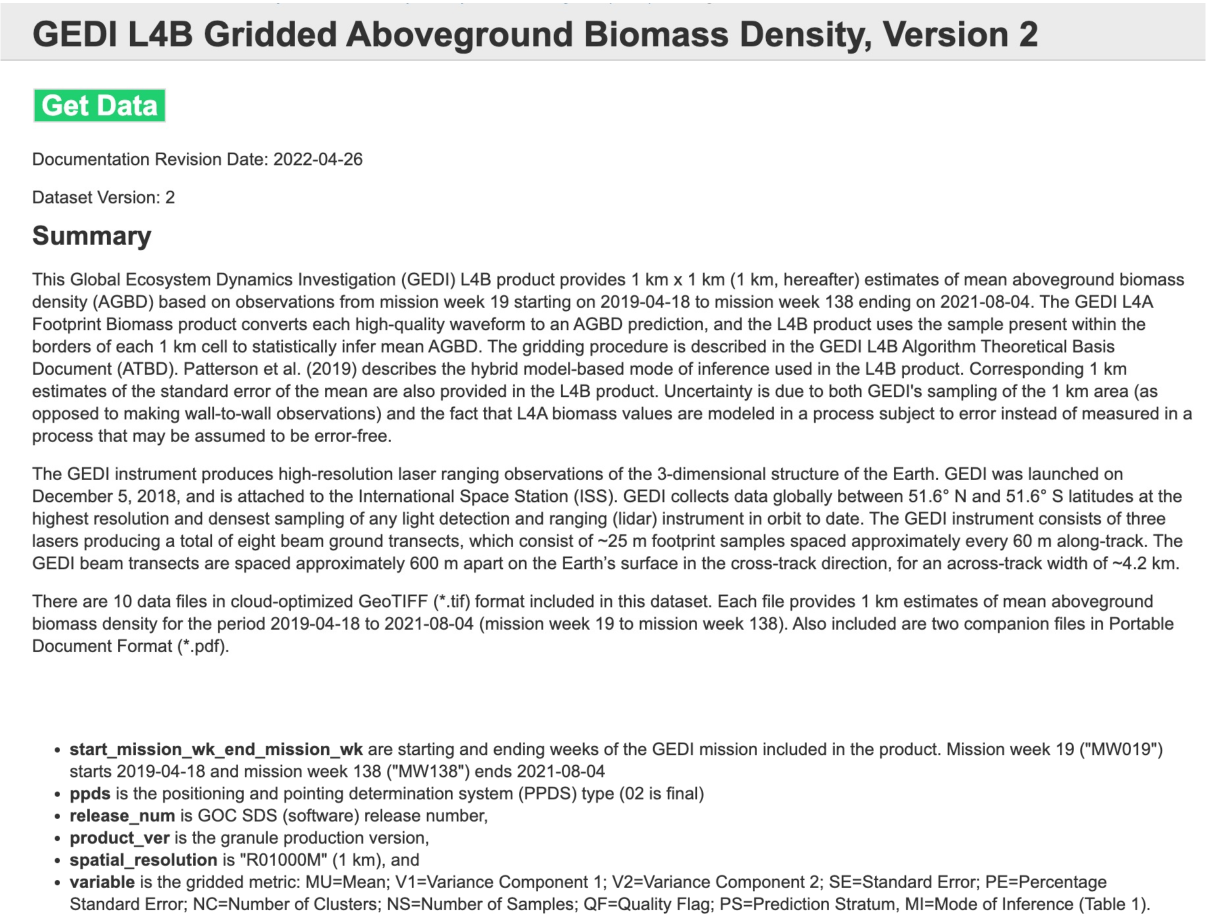
energy_sm	FLOAT32 (MT)	energy_sm	counts	total energy of smoothed waveform
front_threshold	FLOAT32 (MT)	front_threshold	counts	threshold used to detect highest elevation return energy
lastmodeenergy	FLOAT32 (MT)	lastmodeenergy	counts	energy in lowest detected mode
mean	FLOAT32 (MT)	mean	counts	mean noise level used in algorithm
mean_sm	FLOAT32 (MT)	mean_sm	counts	mean noise level after smoothing
min_detection_energy	FLOAT32 (MT)	min_detection_energy	counts	integrated area of the computed minimally-detectable gaussian
min_detection_threshold	FLOAT32 (MT)	min_detection_threshold	counts	detection threshold used to compute the minimally detected gaussian
peak	FLOAT32 (MT)	peak	counts	peak amplitude of raw waveform
pk_sm	FLOAT32 (MT)	pk_sm	counts	peak ampltiude of smoothed waveform
rx_algrunflag	UINT8 (MT)	rx_algrunflag	-	Flag indicating signal was detected and algorithm ran successfully
rx_cumulative	FLOAT32 (MT,101)	rx_cumulative	ns	Waveform bin numbers of integer percents of integrated energy from cumulative waveform (botloc (0%) to toploc (100%))
rx_iwaveamps	FLOAT32 (MT,rx_max_mode_count)	rx_iwaveamps	counts	Fraction of integrated waveform at location of each detected mode
rx_modeamps	FLOAT32 (MT,rx_max_mode_count)	rx_modeamps	counts	Amplitudes of each detected mode within waveform
rx_modeenergytobotloc	FLOAT32 (MT,rx_max_mode_count)	rx_modeenergytobotloc	counts	Total energy from the center of each detected waveform mode to botloc
rx_modelocalenergy	FLOAT32 (MT,rx_max_mode_count)	rx_modelocalenergy	counts	Energy between +- 8 samples of each detected mode, mean noise level removed
rx_modelocalenergyabovemean	FLOAT32 (MT,rx_max_mode_count)	rx_modelocalenergyabovemean	counts	Energy between +- 8 samples of each detected mode
rx_modelocalslope	FLOAT32 (MT,rx_max_mode_count)	rx_modelocalslope	counts	Signal trend within +- 8 samples of each detected mode
rx_modelocs	FLOAT32 (MT,rx_max_mode_count)	rx_modelocs	ns	Sample numbers of each detected mode (relative to bin 0 of waveform)
rx_modewidths	FLOAT32 (MT,rx_max_mode_count)	rx_modewidths	ns	1 sigma width estimates of each detected mode in waveform
rx_nummodes	UINT8 (MT)	rx_nummodes	ns	Number of modes detected in waveform
sd_sm	FLOAT32 (MT)	sd_sm	counts	Noise standard deviation of the smoothed waveform
search_end	FLOAT32 (MT)	search_end	ns	Sample number indicating end of signal search
search_start	FLOAT32 (MT)	search_start	ns	Sample number indicating start of signal search
selected_mode	UINT8 (MT)	selected_mode	-	ID of mode selected as lowest non-noise mode
selected_mode_flag	UINT8 (MT)	selected_mode_flag	-	Flag indicating status of selected_mode
shot_number	UINT64 (MT)	shot_number	L1B	Shot number
smoothwidth	FLOAT32 (MT)	smoothwidth	ns	width of gaussian function used to smooth noise sections of waveforms
smoothwidth_zcross	FLOAT32 (MT)	smoothwidth_zcross	ns	width of gaussian function used to smooth waveform between botloc and toploc
stddev	FLOAT32 (MT)	stddev	countd L1B	noise standdard deviation used in algorithm
toploc	FLOAT32 (MT)	toploc	counts	Sample number of highest detected return
toploc_miss	UINT8 (MT)	toploc_miss	-	Flag indicating algorithm didn't detect valid toploc value
zcross	FLOAT32 (MT)	zcross	ns	Sample number of center of lowest mode above noise level
zcross0	FLOAT32 (MT)	zcross0	ns	location of center of highest mode above noise level relative to bin0 of waveform
zcross_amp	FLOAT32 (MT)	zcross_amp	counts	amplitude of smoothed waveform at lowest detected mode
zcross_localenergy	FLOAT32 (MT)	zcross_localenergy	counts	energy of last mode above local slope
Group: /BEAMXXXX/rx_processing_aN/ancillary				
Label	Datatype (Dimensions)	long_name	units source	description
amp_thresh	FLOAT64 1	amp_thresh	counts cfg	Final ground return pulse selection parameter
ampval_limit2	FLOAT64 1	amval_limit2	counts cfg	Final ground return pulse selection parameter
ampval_limit3	FLOAT64 1	ampval_limit3	counts cfg	Final ground return pulse selection parameter
botlocdist_limit1	FLOAT64 1	botlocdist_limit1	ns cfg	Final ground return pulse selection parameter
botlocdist_limit2	FLOAT64 1	botlocdist_limit2	ns cfg	Final ground return pulse selection parameter
botlocdist_limit3	FLOAT64 1	botlocdist_limit3	ns cfg	Final ground return pulse selection parameter
cumulative_energy_minimum	FLOAT64 1	cumulative_energy_minimum	counts cfg	Final ground return pulse selection parameter
cumulative_energy_thresh	FLOAT64 1	cumulative_energy_thresh	counts cfg	Final ground return pulse selection parameter
enable_select_mode	INT32 1	enable_select_mode	- cfg	Final ground return pulse selection parameter
energy_thresh	FLOAT64 1	energy_thresh	counts cfg	Final ground return pulse selection parameter
preprocessor_threshold	FLOAT64 1	preprocessor threshold	- cfg	Initial search threshold multiplier to detect signal start and end
pulse_sep_thresh	FLOAT64 1	pulse_sep_thresh	ns cfg	Final ground return pulse selection parameter
rx_back_threshold	FLOAT64 1	rx_back_threshold	- cfg	If use_fixed_threshold=0, this is the noise stddev multiplier used to detect the lowest elevation signal. If use_fixed_threshold is non_zero, use the value as the threshold
rx_front_threshold	FLOAT64 1	rx_front_threshold	- cfg	If use_fixed_threshold=0, this is the noise stddev multiplier used to detect the highest elevation signal. If use_fixed_threshold is non_zero, use the value as the threshold
rx_max_mode_count	INT64 1	rx_max_mode_count	- cfg	Maximum number of modes saved for each footprint
rx_searchsize	FLOAT64 1	rx_searchsize	ns cfg	In combination with preprocessor_threshold, used to define area of waveform to be searched by algorithm
rx_sentinel_location	FLOAT64 1	rx_sentinel_location	ns cfg	location of sentinel pulse used by sensitivity algorithm
rx_smoothing_width_locs	FLOAT64 1	rx_smoothing_width_locs	ns cfg	Width of guassian pulse convolved with waveform to reduce noise prior to toploc/botloc identification
rx_smoothing_width_zcross	FLOAT64 1	rx_smoothing_width_zcross	ns cfg	Width of guassian pulse convolved with waveform to reduce noise prior to pulse mode identification
rx_subbin_resolution	INT64 1	rx_subbin_res	- cfg	Factor of increased vertical resolution relative to native waveform resolution (~0.15 m).
rx_use_fixed_thresholds	INT32 1	rx_use_fixed_thresholds	- cfg	If =0, then use values in Front_Threshold and Back_Threshold as the noise stddev multipliers used to detect the highest and lowest elevation returns. If use_fixed_threshold is non_zero, use the value in

GEDI L2A Product Data Dictionary

Dimension Variable	Description
MT	Number of shots

Group: /		
short_name	(Attribute)	GEDI_L2A
Group: /METADATA/DatasetIdentification		
abstract	(Attribute)	The GEDI L2A standard data product contains precise latitude, longitude, elevation, canopy height and surface energy metrics extracted from return waveforms for the various reflecting surfaces located within each laser footprint.
characterSet	(Attribute)	utf8
creationDate	(Attribute)	File creation date
credit	(Attribute)	The software that generates the L2A product was designed and implemented within the GEDI Science Data Processing System at the NASA Goddard Space Flight Center in Greenbelt, Maryland in collaboration with the LVIS (Land, Vegetation, and Ice Sensor) Team and the University of Maryland.
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 L2A dataset is to provide waveform interpretation and extracted products from each GEDI waveform. This includes ground elevation, canopy top height, relative return energy metrics (describing canopy vertical structure, for example), and many other interpreted products from the return waveforms.
shortName	(Attribute)	GEDI_L2A
spatialRepresentationType	(Attribute)	along-track
status	(Attribute)	onGoing
topicCategory	(Attribute)	geoscientificInformation
uuid	(Attribute)	Universally unique identifier (UUID) for this file

Gridded Data



GEDI L4B Gridded Aboveground Biomass Density, Version 2

Get Data

Documentation Revision Date: 2022-04-26

Dataset Version: 2

Summary

This Global Ecosystem Dynamics Investigation (GEDI) L4B product provides 1 km x 1 km (1 km, hereafter) estimates of mean aboveground biomass density (AGBD) based on observations from mission week 19 starting on 2019-04-18 to mission week 138 ending on 2021-08-04. The GEDI L4A Footprint Biomass product converts each high-quality waveform to an AGBD prediction, and the L4B product uses the sample present within the borders of each 1 km cell to statistically infer mean AGBD. The gridding procedure is described in the GEDI L4B Algorithm Theoretical Basis Document (ATBD). Patterson et al. (2019) describes the hybrid model-based mode of inference used in the L4B product. Corresponding 1 km estimates of the standard error of the mean are also provided in the L4B product. Uncertainty is due to both GEDI's sampling of the 1 km area (as opposed to making wall-to-wall observations) and the fact that L4A biomass values are modeled in a process subject to error instead of measured in a process that may be assumed to be error-free.

The GEDI instrument produces high-resolution laser ranging observations of the 3-dimensional structure of the Earth. GEDI was launched on December 5, 2018, and is attached to the International Space Station (ISS). GEDI collects data globally between 51.6° N and 51.6° S latitudes at the highest resolution and densest sampling of any light detection and ranging (lidar) instrument in orbit to date. The GEDI instrument consists of three lasers producing a total of eight beam ground transects, which consist of ~25 m footprint samples spaced approximately every 60 m along-track. The GEDI beam transects are spaced approximately 600 m apart on the Earth's surface in the cross-track direction, for an across-track width of ~4.2 km.

There are 10 data files in cloud-optimized GeoTIFF (*.tif) format included in this dataset. Each file provides 1 km estimates of mean aboveground biomass density for the period 2019-04-18 to 2021-08-04 (mission week 19 to mission week 138). Also included are two companion files in Portable Document Format (*.pdf).

- **start_mission_wk_end_mission_wk** are starting and ending weeks of the GEDI mission included in the product. Mission week 19 ("MW019") starts 2019-04-18 and mission week 138 ("MW138") ends 2021-08-04
- **ppds** is the positioning and pointing determination system (PPDS) type (02 is final)
- **release_num** is GOC SDS (software) release number,
- **product_ver** is the granule production version,
- **spatial_resolution** is "R01000M" (1 km), and
- **variable** is the gridded metric: MU=Mean; V1=Variance Component 1; V2=Variance Component 2; SE=Standard Error; PE=Percentage Standard Error; NC=Number of Clusters; NS=Number of Samples; QF=Quality Flag; PS=Prediction Stratum, MI=Mode of Inference (Table 1).