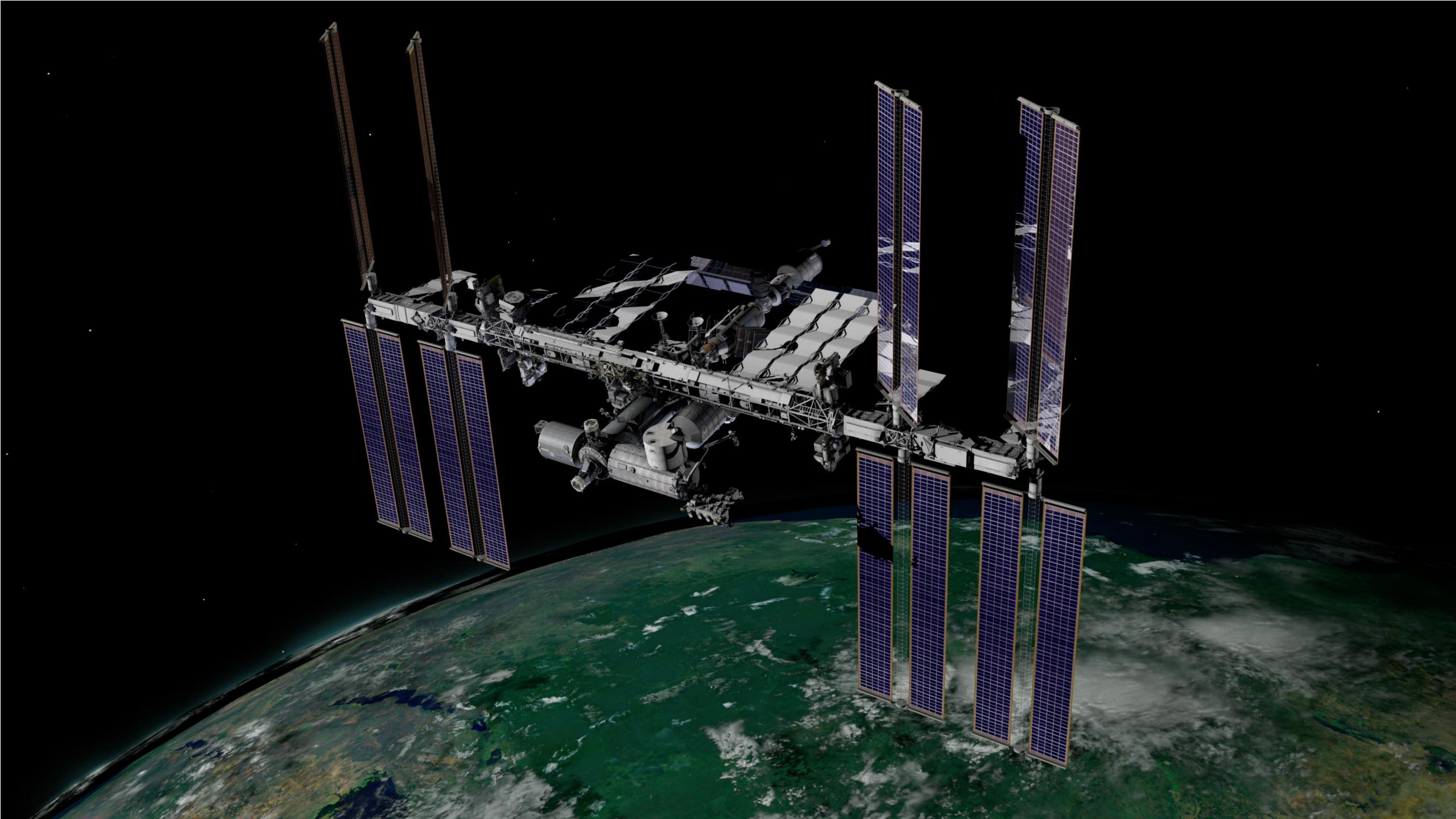


An Introduction to the GEDI mission ...



# GEDI Mission Launch



Atticus Stovall  
@StovallAtticus

YESSSSS!!!!!!

@GEDI\_Knights @NASAEarth



1:20 PM · 12/5/18 from Earth



# GEDI Mission Applications

Forest height and vertical structure; habitat quality & biodiversity;  
Forest carbon sinks & source areas; loss of carbon from extreme events  
such as fires and hurricanes; parameterization of ecosystem models

Forest  
Management &  
Carbon Cycling

Canopy 3D structure that influences snowmelt, evapotranspiration,  
canopy interception of precipitation. Glacier surface elevation change;  
lake & river stage; snowpack elevation; coastal tides.

Water  
Resources

Improved canopy aerodynamic profiles to parameterize weather  
prediction models. Canopy and biomass products that initialize and  
constrain climate models; impacts of land use change on climate

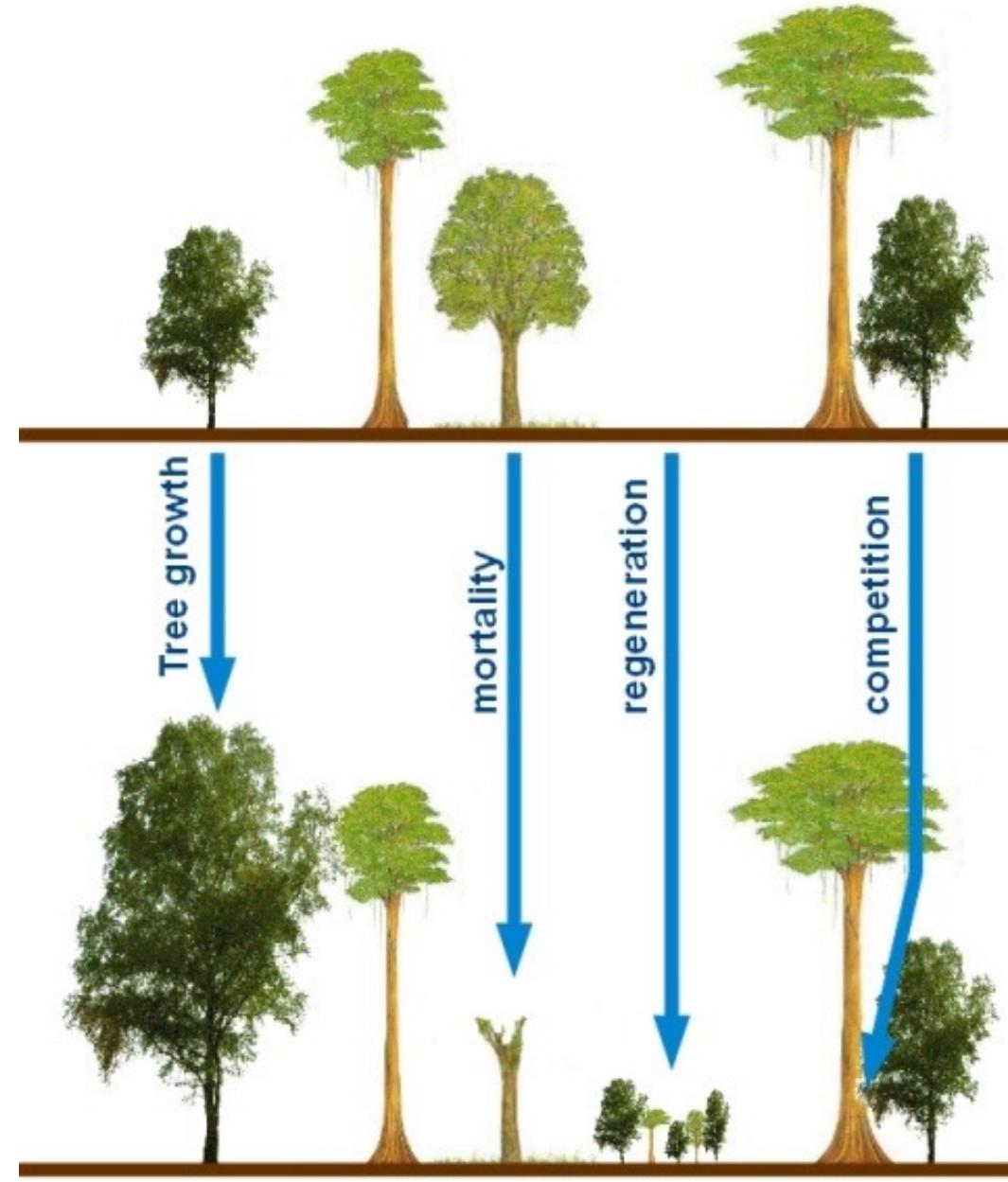
Weather  
Prediction

Accurate bare earth and under canopy topographic elevations for  
improved digital elevation models from radar. Calibration of satellite  
based observations of surface deformation and earthquakes

Topography &  
Surface  
Deformation

# Forest Applications

- CONSERVATION
- BIODIVERSITY
- ECOSYSTEM MODELING
- FIRE MODELING

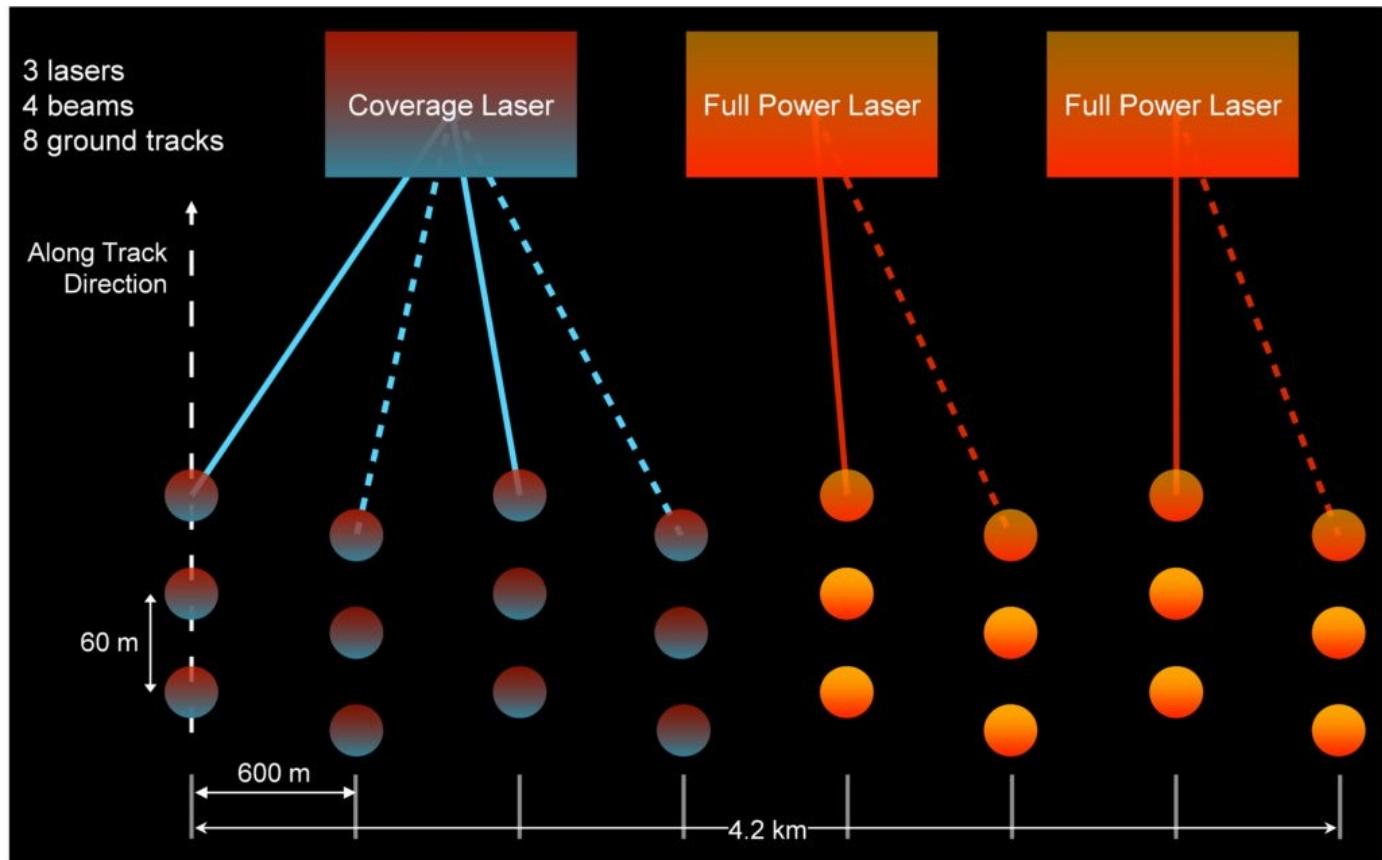


# Technology

GEDI addresses its mission science questions by acquiring lidar waveform (i.e., vertical profile) observations between  $51.6^{\circ}$  N and S latitudes.

## WHAT DOES GEDI MEASURE?

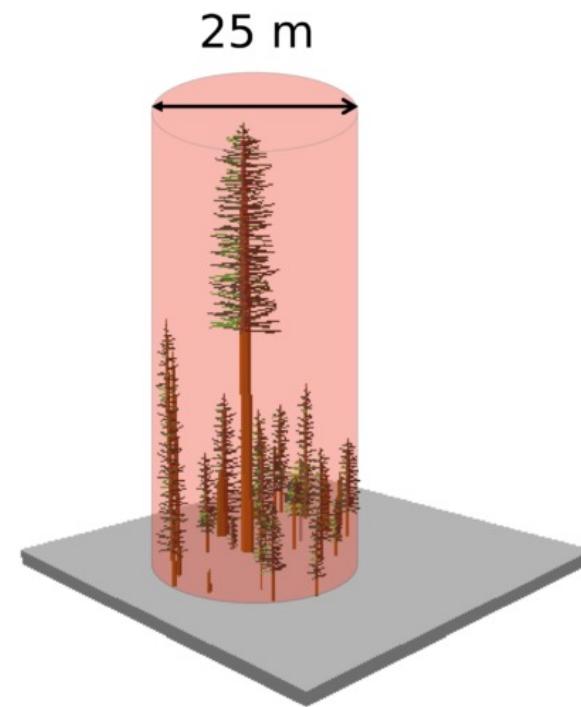
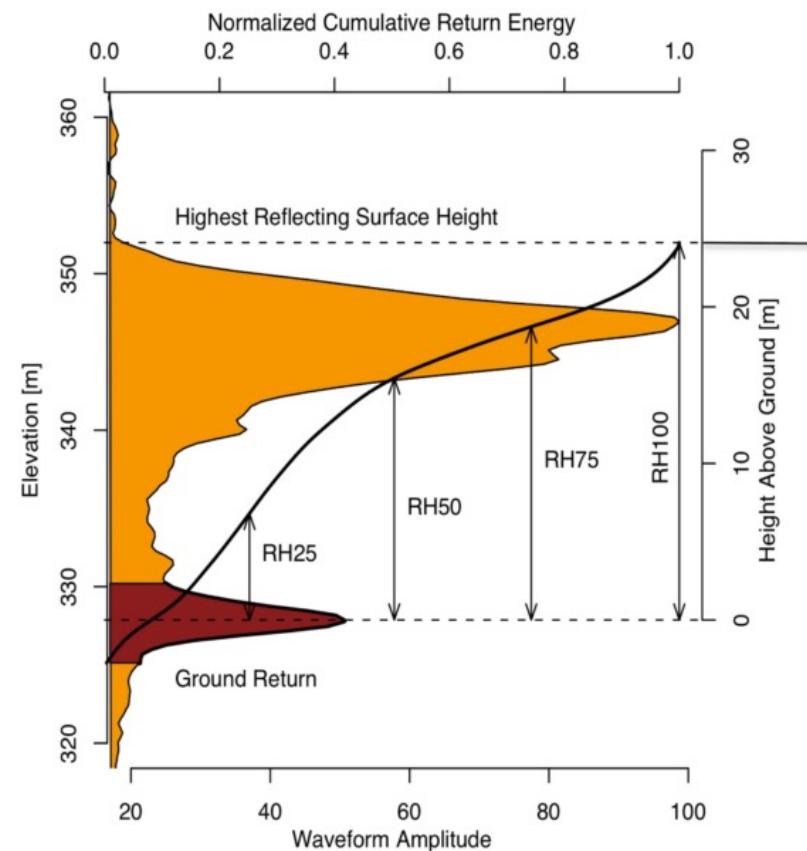
- Lidar waveforms quantify the vertical distribution of vegetation by recording the amount of laser energy reflected by plant material (stems, branches, and leaves) at different heights above the ground. From GEDI waveforms, four types of structure information can be extracted: surface topography, canopy height metrics, canopy cover metrics, and vertical structure metrics.



# GEDI Products

# L2A Product

ATBD #	Data products	Product leads	Resolution
L1A-2A	1A: Raw waveforms, 2A: Ground elevation, canopy top height, relative height (RH) metrics	Michelle Hofton Bryan Blair	25 m (~82 ft) diameter
L1B	Geolocated waveforms	Scott Luthcke Tim Rebold Taylor Thomas Teresa Pennington	25 m (~82 ft) diameter
L2B	Canopy Cover Fraction (CCF), CCF profile, Leaf Area Index (LAI), LAI profile	Hao Tang John Armston	25 m (~82 ft) diameter
L3	Gridded Level 2 metrics	Scott Luthcke Terence Sabaka Sandra Preaux	1 km (~0.6 mi) grid
L4A	Footprint level above ground biomass	Jim Kellner Laura Duncanson John Armston	25 m (~82 ft) diameter
L4B	Gridded Above Ground Biomass Density (AGBD)	Sean Healey Paul Patterson	1 km (~0.6 mi) grid
Demonstrative products	Prognostic ecosystem model outputs	George Hurtt	Grid size: Variable
Demonstrative products	Enhanced height/biomass using fusion with TanDEM-X	Lola Fatoyinbo Seung-Kuk Lee	Grid size: Variable
Demonstrative products	Enhanced height/biomass and biomass change using fusion with Landsat	Matt Hansen Chenquan Huang	Grid size: Variable
Demonstrative products	Biodiversity/habitat model outputs	Scott Goetz Patrick Jantz Pat Burns	Grid size: Variable



# Tons of Applications and Publications

- 280 GEDI publications to date
- Join the Zotero Pub Library for updates
  - [https://www.zotero.org/groups/4931871/gedi peer-reviewed publications](https://www.zotero.org/groups/4931871/gedi_peer-reviewed_publications)

# GEDI Mission Extension to 2031



Abhishek Kidangoor of Mongabay reports on the decision to save GEDI: “The proposed solution calls for temporarily moving GEDI to an alternate location, where it will remain offline for about 18 months while a DOD technology payload completes its mission,’ NASA said in [a statement](#) issued March 17. ‘In 2024, GEDI will return to its original location and resume operations on the station.’ The mission is now expected to “continue through the life of the space station,’ which is set to be retired in 2031.”

		2015					2016					2017					2018					2019														
N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D											
UMD Year 1					UMD Year 2					UMD Year 3					UMD Year 4					UMD Year 5																
Phase A					Phase B					Phase C					Phase D					Phase E																
Formulation					Design and Fabrication					Integration and Test					Science and Mission Operations																					
2020					2021					2022					2023					2024																
J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S				
UMD Year 6					UMD Year 7					UMD Year 8					UMD Year 9					UMD Year 10																
Phase E					Year 1					Year 2					Year 3					Year 4																
Science and Mission Operations					Phase E															Phase F																
					Science Mission Operations															Wrap-Up																

# GEDI Data Access

- The links on the far right provide direct data access, but...
- [Earth Explorer](#) is a much easier means of accessing smaller and more specific study areas.

Product/ Data File	Description	Source	First Data Delivery After IOC	Data Latency	Archive Site
<i>GEDI01_A-TX</i>	Level 1A-TX Transmitted Waveform Fitted Parameters	SOC	First 2 months of L1 released at 6 months	4 months in monthly intervals	Not Publicly Available
<i>GEDI01_A-RX</i>	Level 1A-RX Received Waveform Fitted Parameters	SOC	First 2 months of L1 released at 6 months	4 months in monthly intervals	Not Publicly Available
<i>GEDI01_B</i>	Level 1B Geolocated Waveforms	SOC	First 2 months of L1 released at 6 months	4 months in monthly intervals	<a href="#">LPDAAC</a>
<i>GEDI02_A</i>	Level 2A Elevation and Height Metrics	SOC	First 2 months of L2 released at 6 months	4 months in monthly intervals	<a href="#">LPDAAC</a>
<i>GEDI02_B</i>	Level 2B Canopy Cover and Vertical Profile Metrics	SOC	First 2 months of L2 released at 6 months	4 months in monthly intervals	<a href="#">LPDAAC</a>
<i>GEDI03</i>	Level 3A Gridded Land Surface Metrics	SOC	Populated with first 2 months of L2 data at 6 months	4 months in monthly intervals	<a href="#">ORNLDAAAC</a>
<i>GEDI04_A</i>	Level 4A Footprint Above Ground Biomass	SOC	First 12 months of L3 data at 17 months	6 months after global sampling required to meet L1 requirement	<a href="#">ORNLDAAAC</a>
<i>GEDI04_B</i>	Level 4B Gridded Above Ground Biomass	SOC	First 12 months of L3 data at 17 months	6 months after global sampling required to meet L1 requirement	<a href="#">ORNLDAAAC</a>