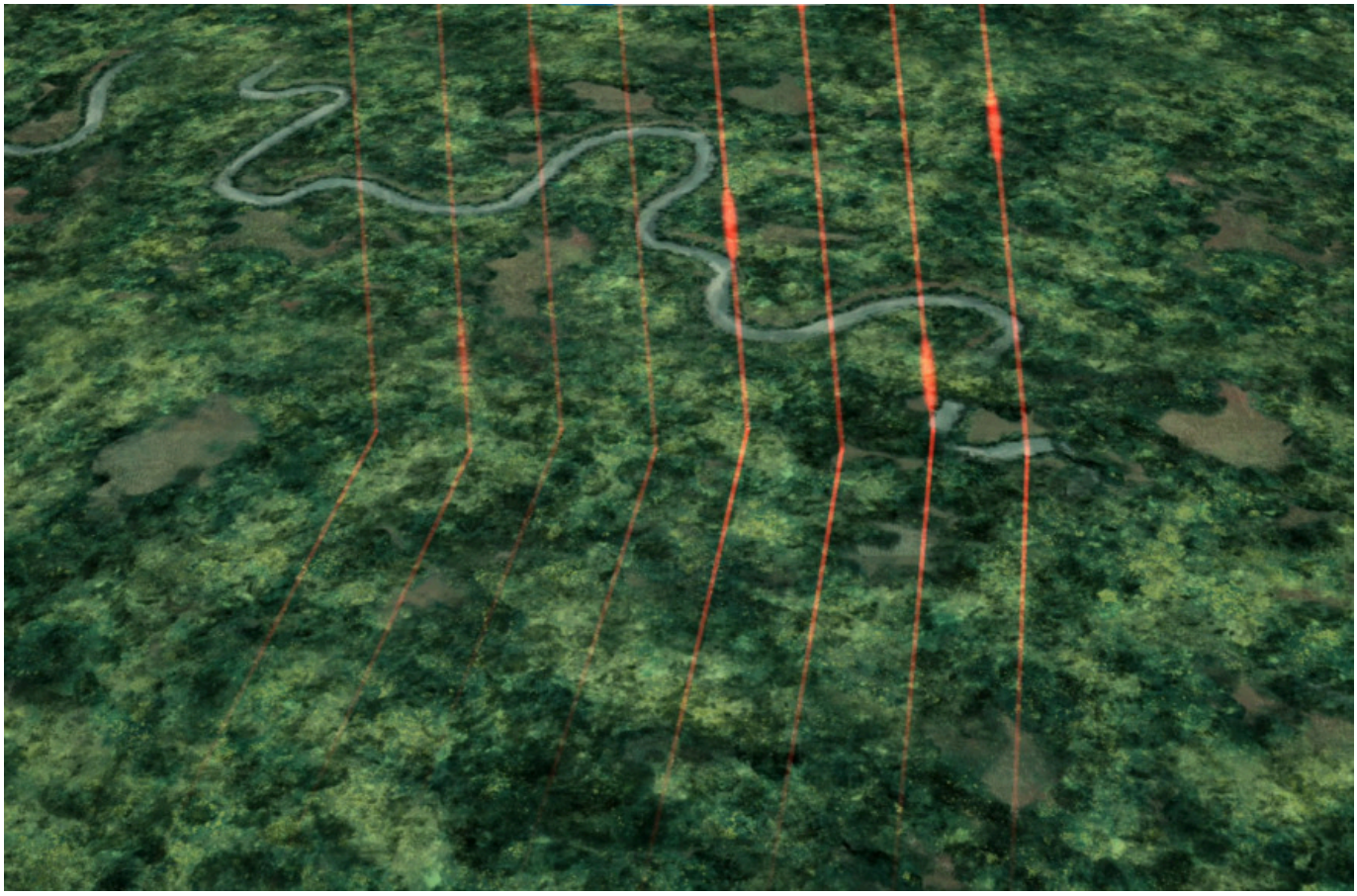
MAAP #160: Lasers Estimate Carbon in the Amazon – NASA's GEDI Mission

July 7, 2022



(https://www.maapprogram.org/wp-content/uploads/2022/06/maaproject.org-maap-xyx-lasers-to-estimate-carbon-in-the-amazon-nasas-gedi-mission-shot-2.jpg)

Simulation of GEDI lasers collecting data. Source: UMD.

NASA's GEDI mission uses lasers to provide cutting-edge estimates of aboveground biomass and related carbon on a global scale.

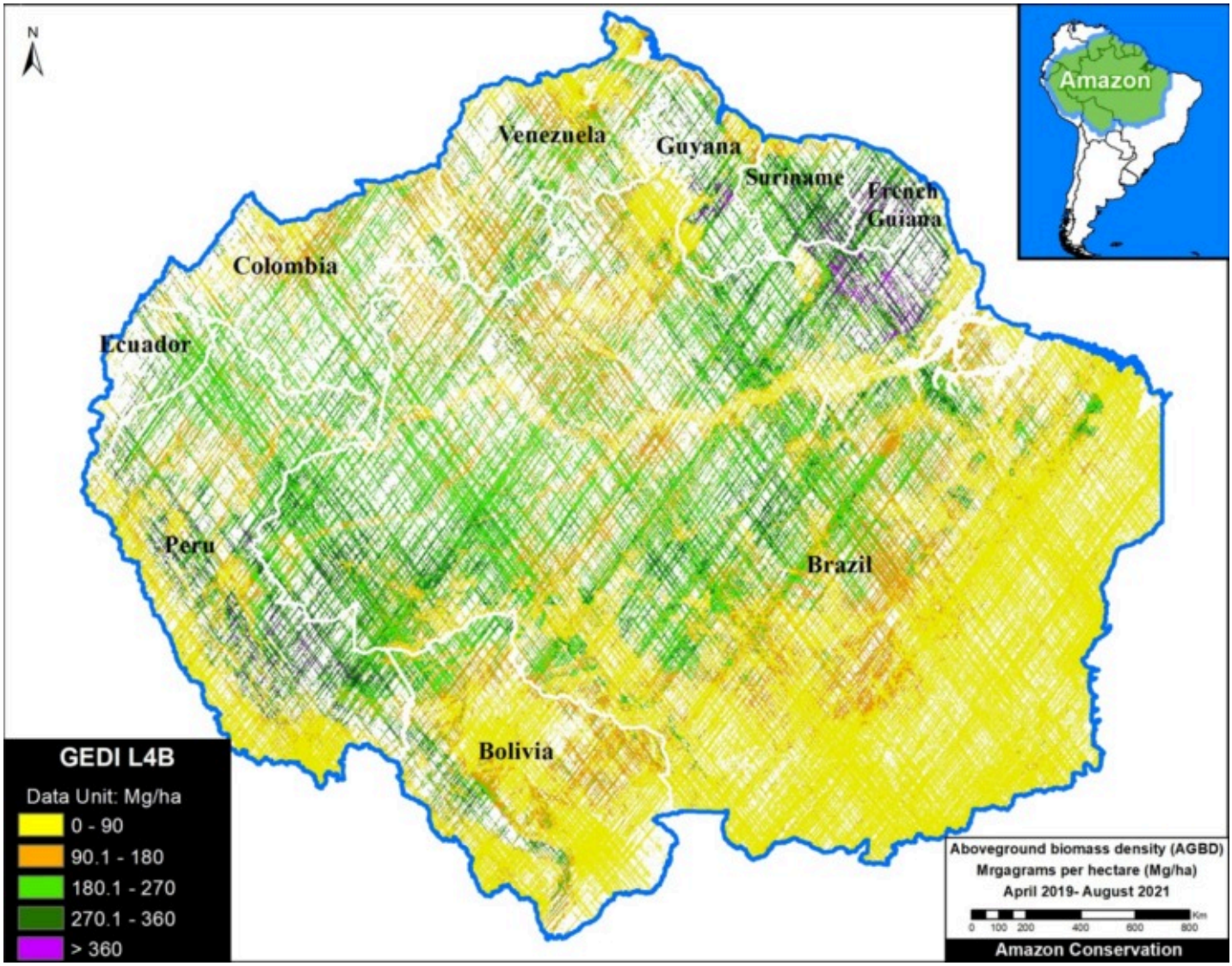
Launched in late 2018 and installed on the International Space Station, GEDI's lasers return an estimate of **aboveground biomass density** at greater accuracy and resolution than previously

Here, we zoom in on **the Amazon** and take a first look at the recently available Level 4B data: Gridded Aboveground Biomass Density measured in megagrams per hectare (Mg/ha) at a 1-kilometer resolution.

See the GEDI homepage (https://gedi.umd.edu/) for more background information on the mission, which extends until January 2023. Be sure to check out this illustrative video (http://svs.gsfc.nasa.gov/vis/a010000/a013000/a013090/GEDI_beauty_waveform_youtube_4k.m_=1).

Base Map – Aboveground Biomass in the Amazon

The **Base Map** displays the GEDI data for the nine countries of the Amazon biome, displaying aboveground biomass for the time period April 2019 to August 2021.



(https://www.maapprogram.org/wp-content/uploads/2022/06/maaproject.org-maap-xyx-lasers-to-estimate-carbon-in-the-amazon-nasas-gedi-mission-MAPA-GEDI-v2.jpg)

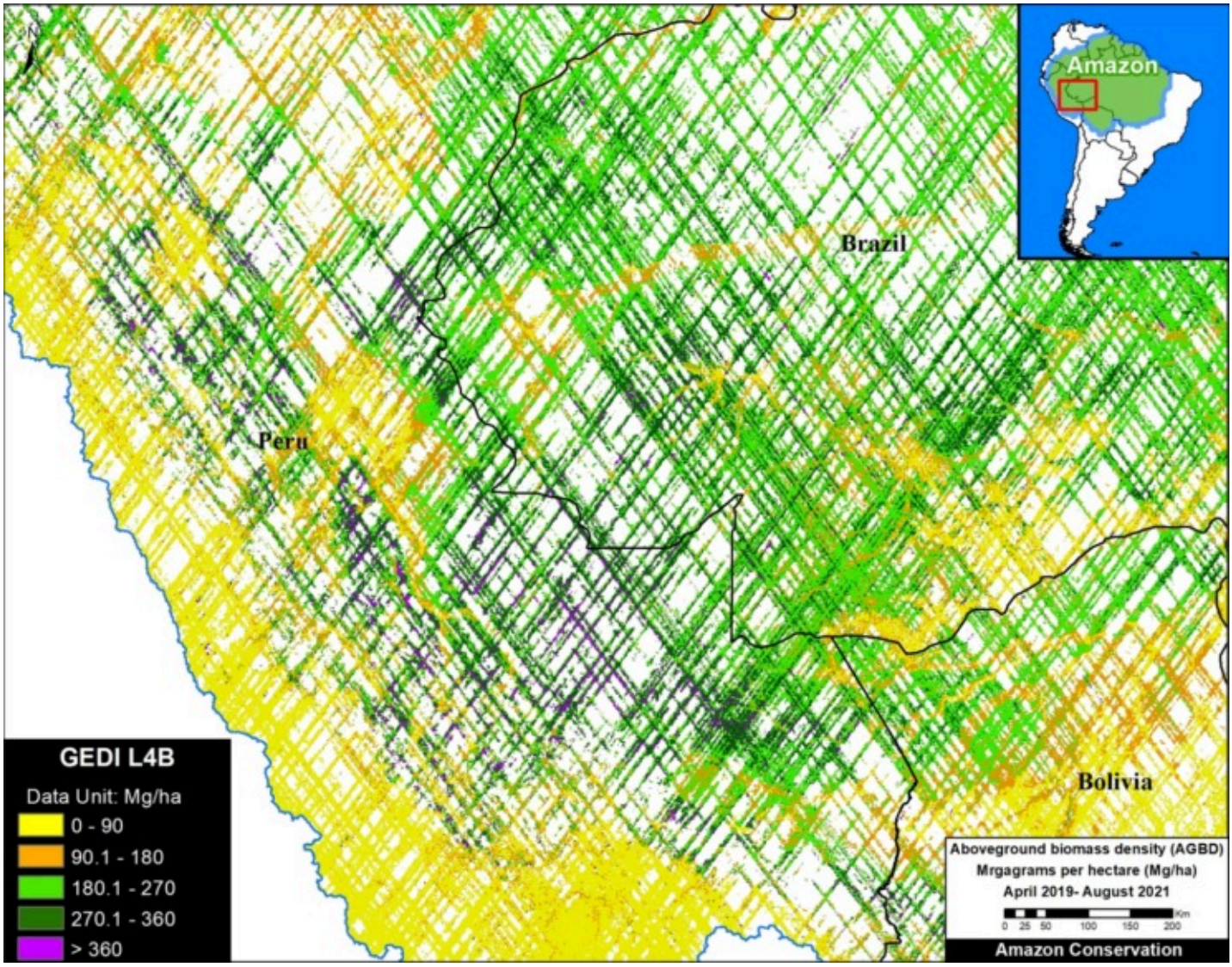
Base Map. Aboveground Biomass Density in the Amazon. Data: NASA/UMD GEDI L4B. Click twice to enlarge.

We highlight the following initial **major findings**:

- The data is not yet comprehensive as there are some areas the lasers have not yet recorded data (indicated in white).
  h
- The areas with the **highest aboveground biomass** and related carbon (indicated in dark green and purple) include:
  - Northeast Amazon: Corner of Brazil, Suriname, & French Guiana.
  - Southwest Amazon: Southwest Brazil and adjacent Peru (see zoom below).
  - Northwest Amazon: Northern Peru, Ecuador, and southeast Colombia.

Zoom In – Southwest Amazon

To better visualize the GEDI laser data, we also present a zoom of the Southwest Amazon. Although deforested areas (and natural savannahs) are illustrated in yellow and orange, note the surrounding presence of high carbon forest (green and purple).

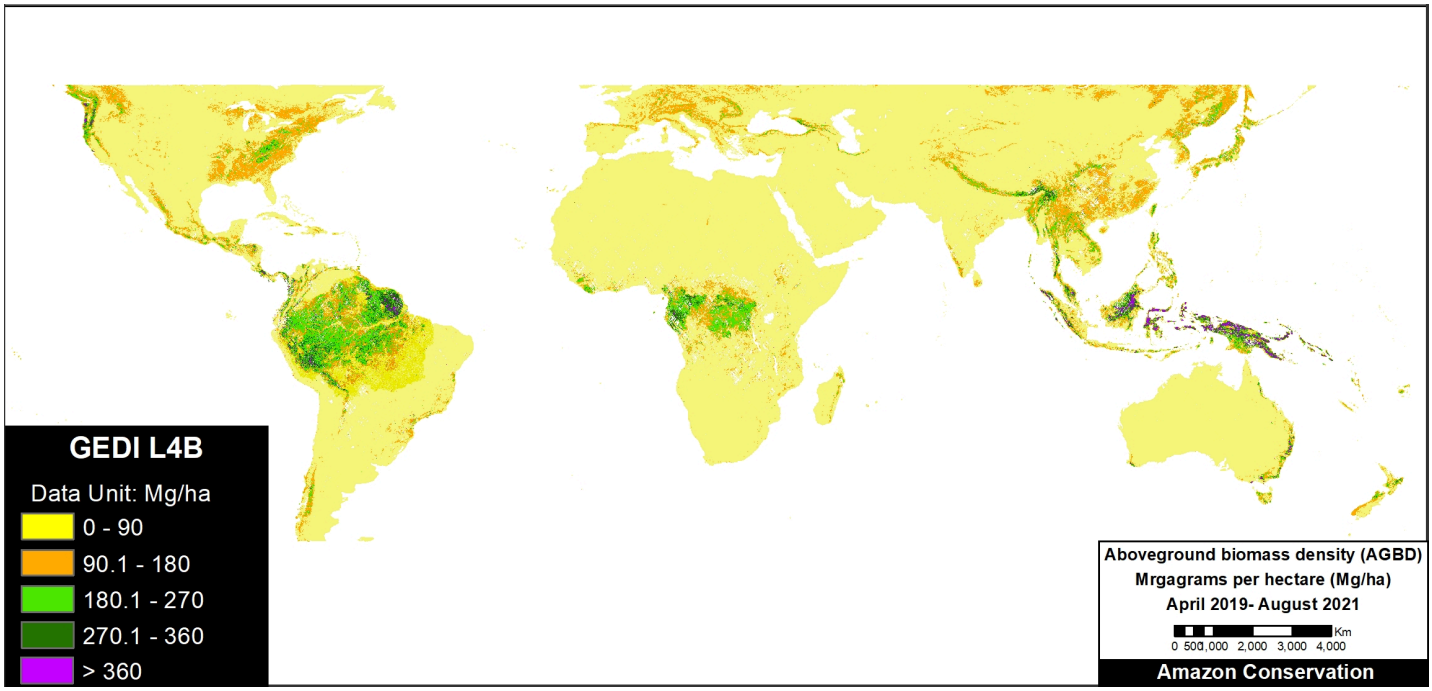


(https://www.maapprogram.org/wp-content/uploads/2022/06/maaproject.org-maap-xyx-lasers-to-estimate-carbon-in-the-amazon-nasas-gedi-mission-GEDI-ZOOM.jpg)

Zoom In – Southwest Amazon. Aboveground Biomass Density. Data: NASA/UMD GEDI L4B. Click twice to enlarge.

Zoom Out – Global Scale

Note that tropical forests, including the Amazon, have the highest levels of aboveground biomass globally.



(https://www.maapprogram.org/wp-content/uploads/2022/07/maaproject.org-maap-160-lasers-estimate-carbon-in-the-amazon-nasas-gedi-mission-GEDI-GLOBAL.jpg)

Zoom Out – Glocal scale. Aboveground Biomass Density. Data: NASA/UMD GEDI L4B. Click twice to enlarge.

Acknowledgements

This work was supported by NORAD (Norwegian Agency for Development Cooperation) and ICFC (International Conservation Fund of Canada).

Citation

Finer M, Ariñez A (2022) Lasers Estimate Carbon in the Amazon – NASA's GEDI Mission. MAAP: 160.