

# GEDI Spatial Querying and Subsetting Quick Guide

The Global Ecosystem Dynamics Investigation (GEDI) instrument aboard the International Space Station (ISS) collects light detection and ranging (lidar) full waveform observations. The Level 1B Geolocated Waveform Data ([GEDI01\\_B](#)), Level 2A Elevation and Height Metrics Data ([GEDI02\\_A](#)), and Level 2B Canopy Cover and Vertical Profile Metrics Data ([GEDI02\\_B](#)) granules are available through the [LP DAAC Data Pool](#) and [NASA's Earthdata Search](#). However, each GEDI Version 1 granule encompasses an entire ISS orbit resulting in complex data files with a nearly global footprint that are challenging to spatially query.

Instructions on how to find granules that contain data for a region of interest (ROI) and how to perform spatial and/or layer subsetting of GEDI full orbits accessed from the LP DAAC Data Pool and NASA's Earthdata Search are provided below. [Earthdata Login credentials](#) are required to download GEDI data products.

## Step 1: Find granules that contain data for a region of interest (Spatial Querying)

The [GEDI Finder](#) web service allows users to spatially query the GEDI archive by submitting a bounding box region of interest (ROI) to identify GEDI01\_B, GEDI02\_A, or GEDI02\_B granules intersecting the specified ROI. The GEDI Finder web service will return a list of links to download each of the GEDI orbits intersecting the ROI from the LP DAAC Data Pool. The [GEDI Finder User Guide](#) provides detailed instructions on how to use the web service. The GEDI Finder is currently the only option to identify granules for a ROI since spatial querying for the GEDI Version 1 products is not available in Earthdata Search Client.

## Step 2: Perform spatial and/or layer subsetting of GEDI granules (Subsetting)

Directions are given below for spatial and/or layer subsetting of GEDI granules using the LP DAAC Data Pool and for NASA's Earthdata Search. Read the two options given below to decide which will work best for you. The main difference is that the Data Pool requires that the GEDI granules be downloaded prior to subsetting. In addition, use of the GEDI Subsetter Data Prep Script will produce outputs that are subsetted in GeoJSON format, whereas the Earthdata Search outputs are in Hierarchical Data Format Version 5 (HDF5).

## LP DAAC Data Pool

### Step A: Access data from LP DAAC Data Pool

After completing **Step 1** above, the granules generated from the GEDI Finder will need to be downloaded. The list contains active URL links that can be downloaded individually from a web browser. For longer lists or to automate the downloading process, save the links to a .csv file (see page 4 of the [GEDI Finder User Guide](#)) then automate the downloading of the GEDI files using [DAAC2Disk](#) or [command line utilities wget and curl](#). Additionally, R or Python can be used to download data directly from the .csv file using the scripts provided in [How to Access the LP DAAC Data Pool with R](#) and [How to Access the LP](#)


[DAAC Data Pool with Python](#). To download data, sign in with NASA Earthdata Login credentials or [register](#) for a new account.

### **Step B: Perform spatial and/or layer subsetting of GEDI granules**

The GEDI Spatial and Band/Layer Subsetting and Export to GeoJSON ([GEDI Subsetter](#)) script is a command line executable Python script that allows users to spatially subset GEDI files by submitting a GeoJSON or bounding box for a ROI. Users can also perform layer subsetting by defining specific GEDI dataset layers to be included in the subset output. The script will extract the desired layers, clip to the ROI, and export as a GeoJSON file that can easily be loaded into GIS and/or remote sensing software for further visualization and analysis.

## **NASA's Earthdata Search**

### **Step A: Access Earthdata Search**

After completing **Step 1** above, open [NASA Earthdata Search](#). Sign in with Earthdata Login credentials ( Earthdata Login) or [register](#) for a new account.

Note: Currently there are no spatial searching capabilities for the GEDI Version 1 datasets in Earthdata Search. Follow the directions in Step 1 to find granules that contain data for a ROI.

### **Step B: Search for Dataset**

Search for a collection by entering the dataset short name (e.g. GEDI01\_B) into the search box then select the desired product from the list of matching collections. All available granules for the product will be included in the list of matching granules.

### **Step C: Create Granule ID List**

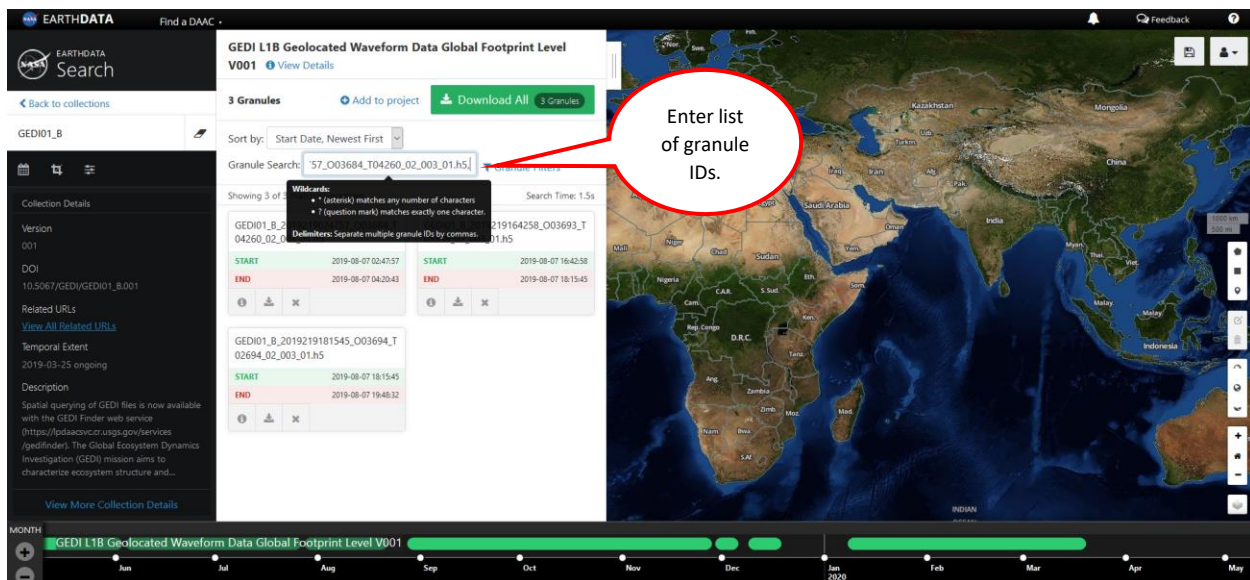
Copy the list of URLs returned by the GEDI Finder and paste it into a text editor. Truncate the URLs to create a list of just the granule IDs separated by commas.

Example:

```
GEDI01_B_2019246134339_O04110_T01535_02_003_01.h5,  
GEDI01_B_2019245143123_O04095_T00556_02_003_01.h5,  
GEDI01_B_2019245082007_O04091_T00705_02_003_01.h5
```

### **Step D: Search for Granules**

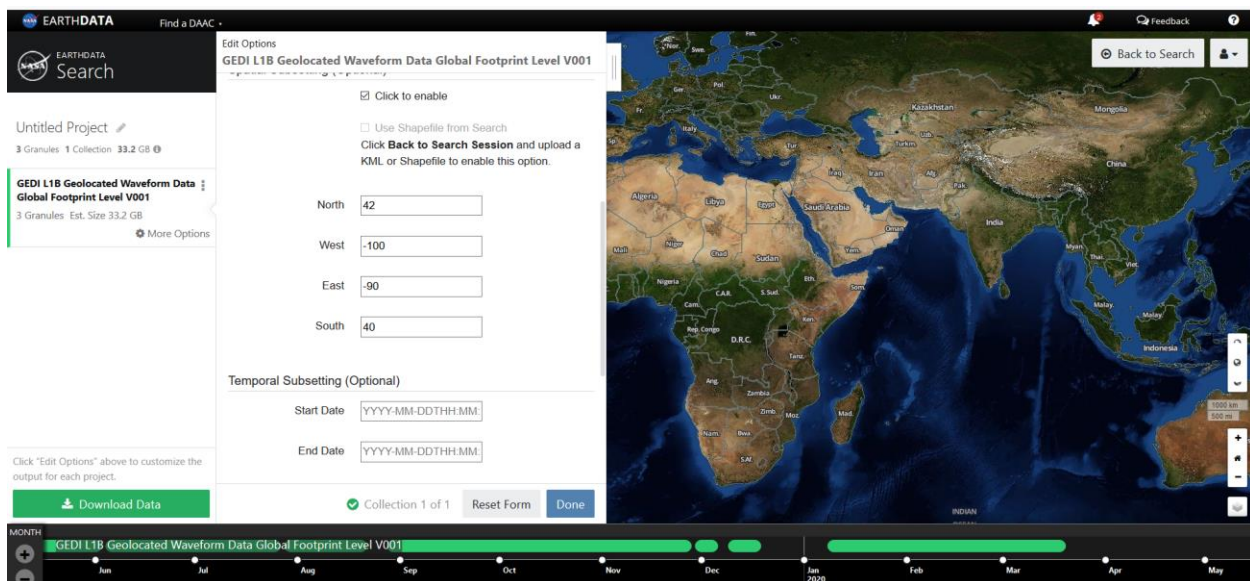
Copy the list of comma-separated granule IDs and paste it into the Granule Search box in Earthdata Search. Use the Enter key to initiate the search.



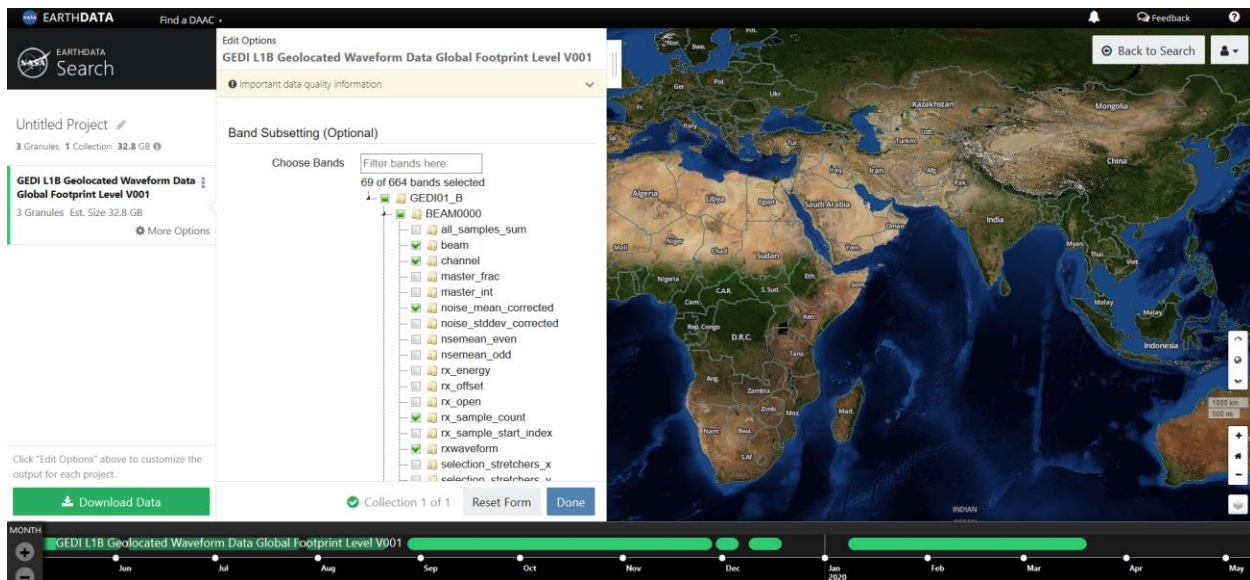
### Step E: Select spatial and/or layer parameters for GEDI granules

Click on the green Download All button to open the download and order menu. Under “Select Data Access Method,” select Customize.

To set up the parameters for clipping out a smaller area of the granule, scroll down to the Spatial Subsetting section. Check the box next to Click to Enable and enter coordinates of the bounding box for the ROI.



To select specific science dataset layers, scroll down to the Band Subsetting section. Expand the directories and select the desired layers. Additional information for each of the data layers can be found on the [GEDI01\\_B](#), [GEDI02\\_A](#), or [GEDI02\\_B](#) Digital Object Identifier (DOI) landing page.



## Step F: Place Order

After the desired parameters for spatial and/or layer subsetting have been selected, click Done to complete the custom order form then click Download Data to initiate the order. When the data request is submitted, an order confirmation email is sent to the email address associated with the Earthdata login credentials or specified in the custom order form.

## Step G: Retrieve Data

A status update email for the data processing request will be delivered when the order has completed. The order completion email contains URLs for accessing the data outputs. Please note that the URLs have an expiration date and are only valid for one week.

Please contact LP DAAC User Services at [lpdaac@usgs.gov](mailto:lpdaac@usgs.gov) with any questions about the request. Be sure to reference the request ID in any correspondence.

## Step H: Export to GeoJSON

To convert the .h5 output files from Earthdata Search to GeoJSON, follow the instructions under LP DAAC Data Pool: **Step B** above.