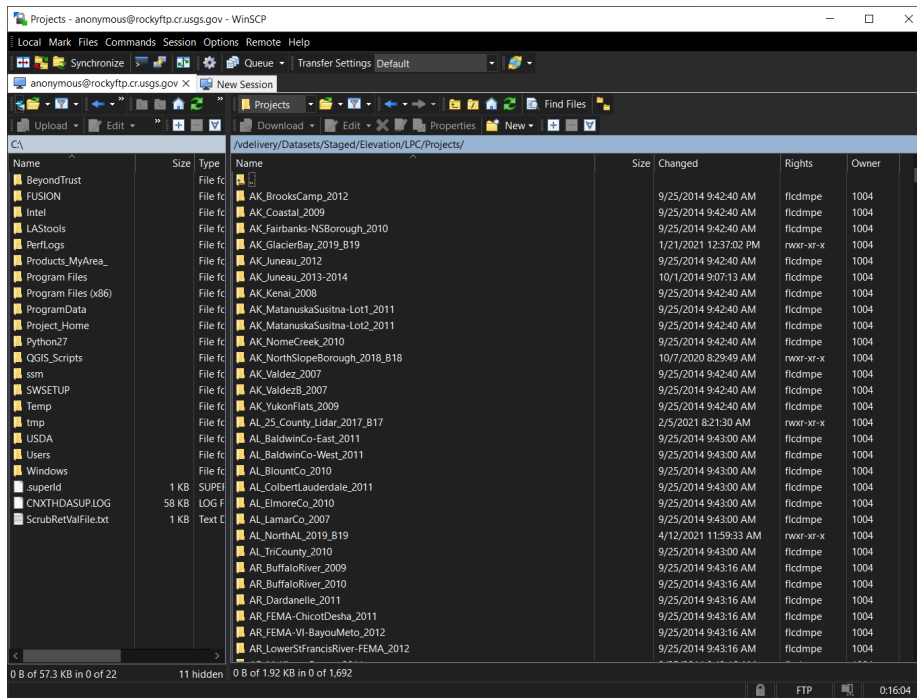


USGS 3DEP FTP User Guide



Introduction

The USGS manages and disseminates massive amounts of lidar data that can be downloaded in multiple ways. The primary ways to download lidar point cloud files (.laz) and digital elevation models (DEM) is either through The National Map or through the USGS FTP. If you are interested in downloading a subset of data overlapping with a relatively small area of interest, we recommend using The National Map, which allows you to select data based on manually drawn AOIs or uploaded shapefiles. If you are interested in downloading data for an entire acquisition, however, we recommend you use an FTP client to download data from the USGS Rocky Mountain FTP.

This user guide walks you through process of downloading large amounts of lidar data from the USGS FTP using WinSCP, a Forest Service approved software that you can quickly and easily install from the Software Center. To learn more about lidar data that has been collected in your area of interest, refer to the [United States Interagency Elevation Inventory website](#). The data on this FTP is primarily 3DEP data and other USGS holdings, so not all lidar data that has been collected in the conterminous US is available via this website. It is also important to consider how and where you are downloading data from this FTP. A full lidar acquisition requires a lot of storage space, especially for the point cloud data, so data transfer can take up to several days or more depending on your network connection and where you are storing the data. We recommend that you only transfer data using a computer that is connected directly to Forest Service wifi, not over VPN. This may require using a remote desktop connection when working remotely.



Objectives

- Install WinSCP from the USFS Software Center
- Download LAS data from the USGS Rocky Mountain FTP
- Download DEM data from the USGS Rocky Mountain FTP

Prerequisites

- **You must be connected to the Forest Service network to download applications from the Software Center. Sign into the VPN if you are not connected to local Forest Service wifi.**



USDA Non-Discrimination Statement

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotope, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at [How to File a Program Discrimination Complaint](#) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.



Table of Contents

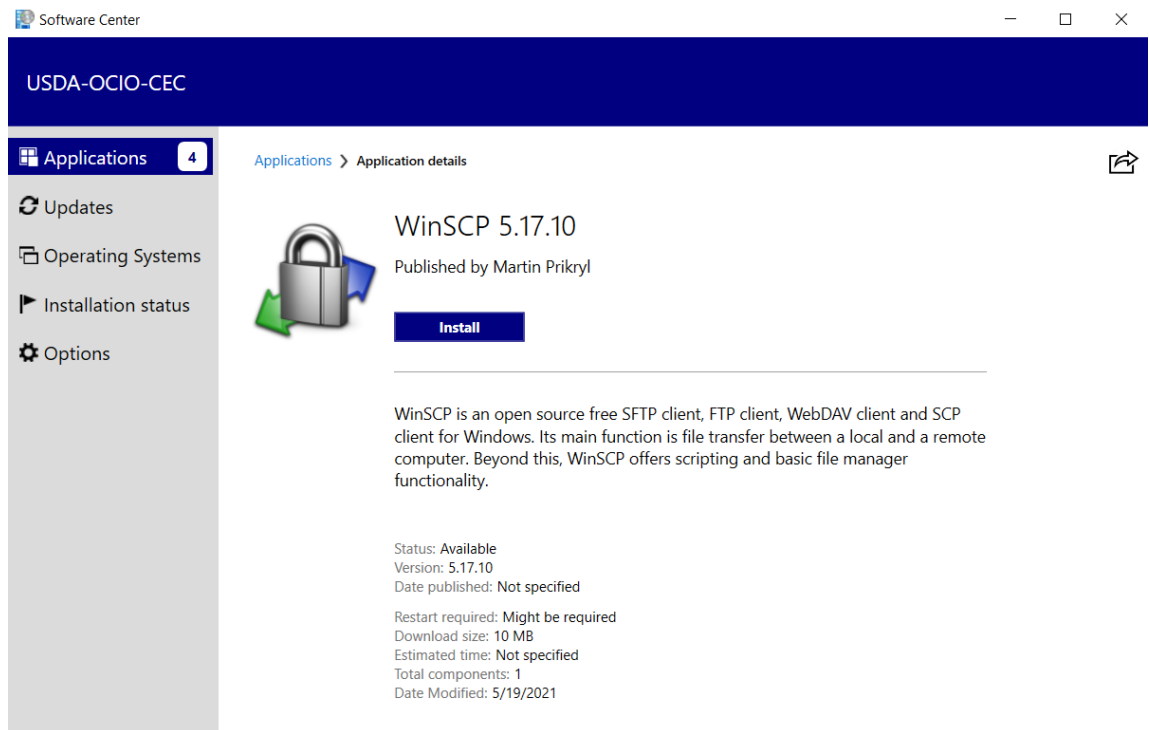
Part 1: Install WinSCP	5
Part 2: Connect to the USGS FTP in WinSCP	5
Part 3: Navigate to Lidar Point Cloud Data	6
Part 4: Download LAZ and DEM data	9

Part 1: Install WinSCP

The first step is to open the Software Center application on your computer and install WinSCP.

A. Open the Software Center App

1. Click the Search bar at the bottom of your computer where it says, "Type here to search."
2. Type **Software Center** and then click the Software Center app in the search results window.
3. In the upper right corner of the Software Center app, type **WinSCP** into the Search bar and hit enter.
4. Double click the version of WinSCP that's available and then click the **Install** button. It doesn't take long to download the software.

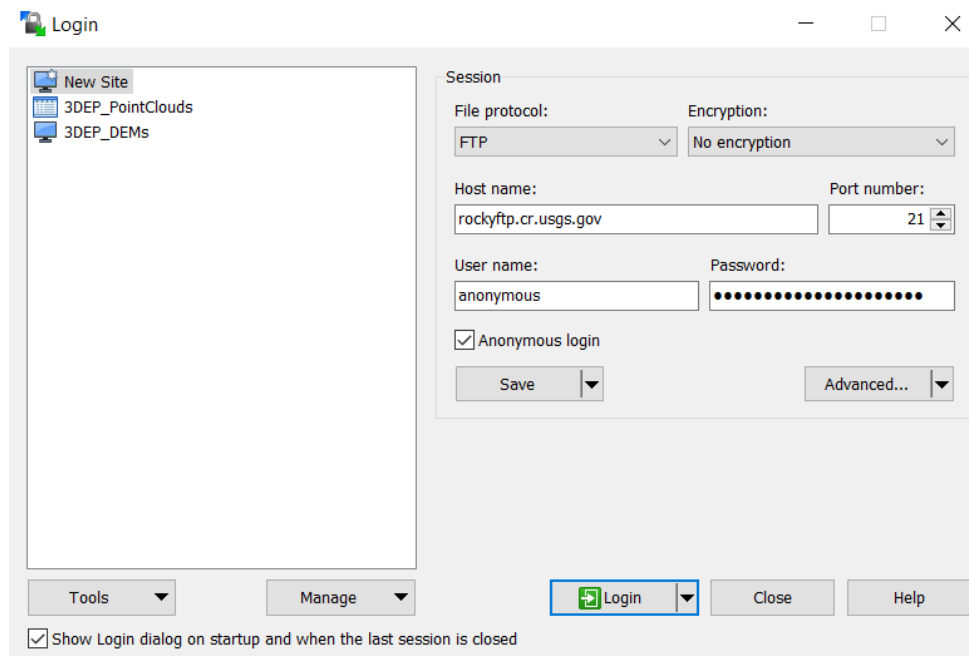


Part 2: Connect to the USGS FTP in WinSCP

A. Open WinSCP

1. In the search bar at the bottom left of your computer, type **WinSCP** and select the WinSCP app that pops up in the search results. When the app opens, you will see a Login window.
2. Ensure that the **New Site** option on the left of the login window is selected.
3. Click the **File protocol** dropdown menu and select **FTP**.
4. Under **Host** name paste this URL:
<ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Elevation/>
5. Check the box next to **Anonymous Login** and notice that the User name and Password are automatically populated.

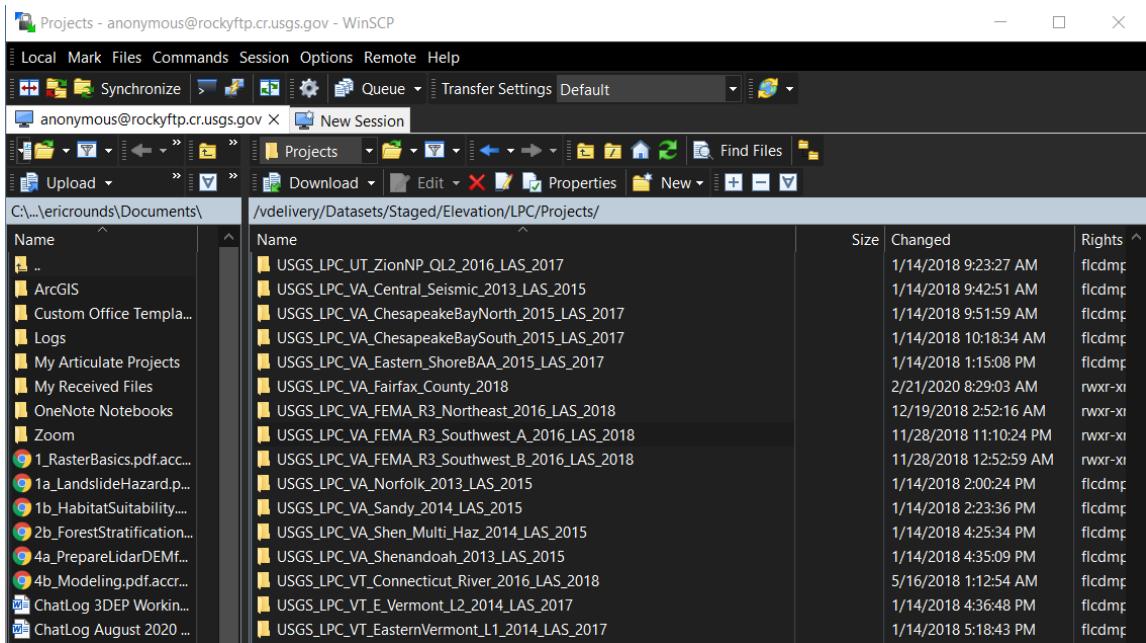
6. If you plan on consistently accessing this FTP, we recommend saving the FTP connection so that you can easily access connect to it again whenever you open WinSCP. To save this connection, simply click the **Save** button, enter an intuitive **Site name** and click **OK**.
7. Finally, click **Login** to connect to the FTP.



Part 3: Navigate to Lidar Point Cloud Data

A. Identify and Open Acquisition Folder

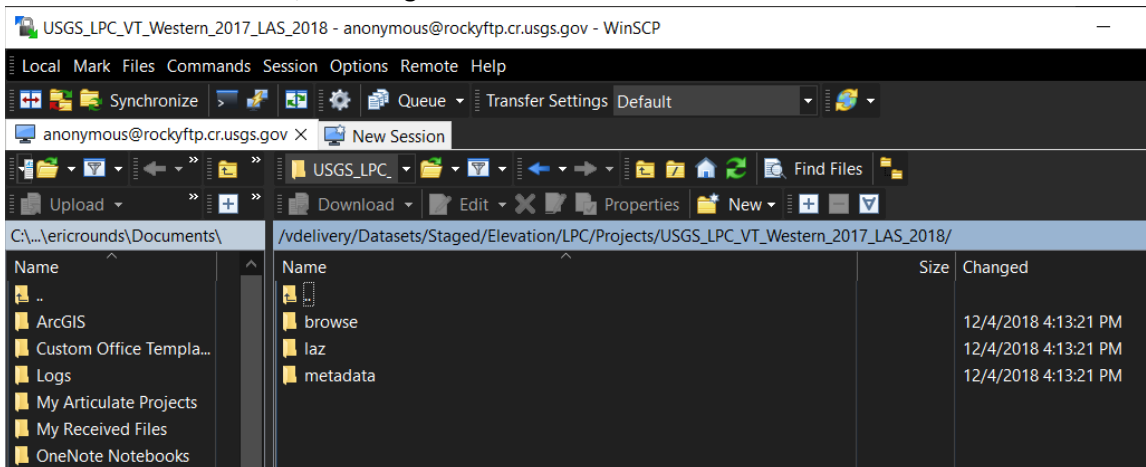
1. Once you successfully login, the WinSCP window will open to the base Elevation folder on the USGS FTP. There are numerous subfolders that contain different datasets, but we are just going to focus on available lidar point cloud (.laz/.las) and DEM (.tif) data.
2. Double click on the **LPC** folder and then double click the **Projects** folder.
3. This folder contains a suite of lidar point cloud data organized in folders by the state and year each acquisition took place.
 - i. The majority of folders containing recent acquisitions have names beginning with **USGS_LPC**.



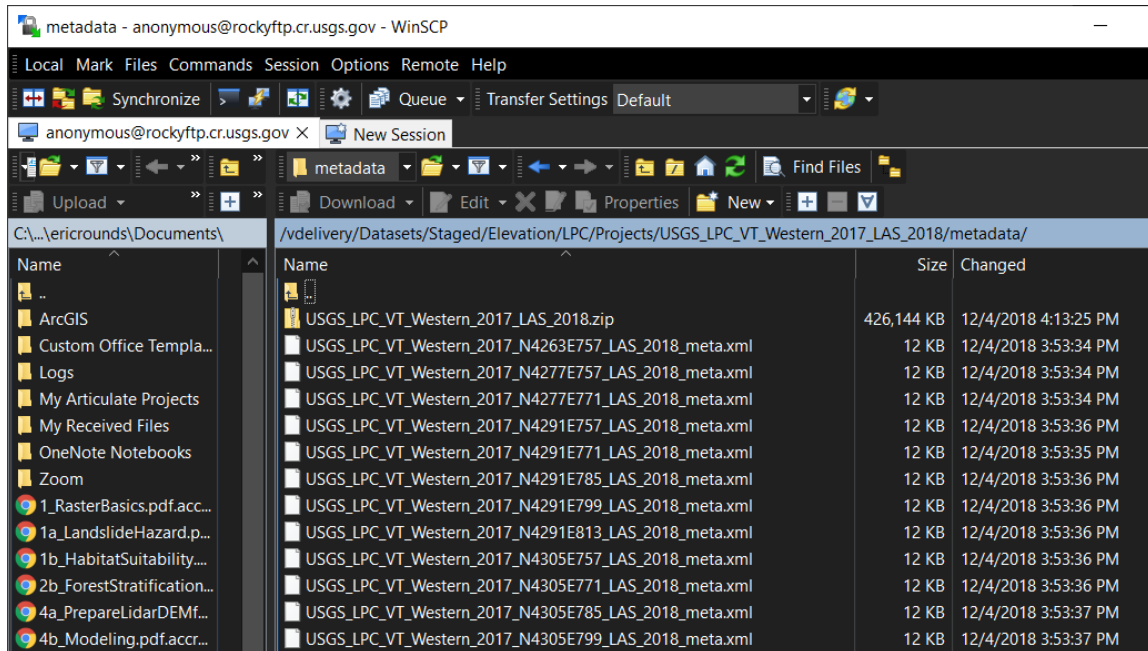
Note: there are over 1,600 different folders in the LPC Project folder, so it may be difficult to track down the exact acquisition you are looking for. If you are having trouble finding a particular acquisition, we recommend that you contact the [USGS National Map Liaison](#) for the state you are looking for data in. They will be able to help you find the exact name of the acquisition you are looking for.

Also, as a reminder, this is not a repository of all the lidar data collected in the US. There are some lidar datasets collected on Forest Service land that are not associated with the USGS, so they are likely available through either your Regional Office or the primary agency that funded the acquisition. Reach out to your Regional Remote Sensing Coordinator or refer to the [United States Interagency Elevation Inventory website](#) to learn more about where to access non-3DEP data.

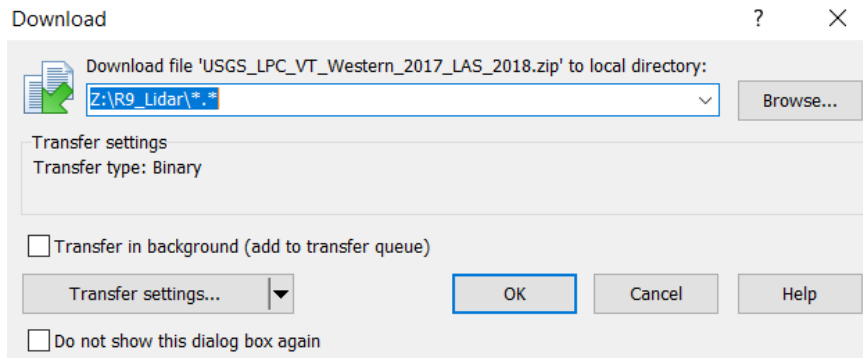
4. Navigate to the acquisition folder you are interested in and double click it. The next subfolder contains a few folders, including a **laz** and **metadata** folder.



5. Double click the **metadata** folder to open it. Most of these folders contain both individual XML metadata files for each file as well as a zip file. We recommend downloading the zip file because it contains more than just XML metadata.



6. To download the zip file, select it and then click the **Download** button in the header of WinSCP.
7. A Download window pops up that enables you to select the folder that you download data to. Use the **Browse** button to open a window that allows you to select a folder that is on your local desktop or a network drive location that is already mapped in your File Explorer.
 - i. Alternatively, open a File Explorer window, navigate to the folder where you would like to download the zip file to, and then copy the file path from the address bar in the header of your File Explorer. You can then paste that file path into the Download dialog box. However, you must make sure to keep the “*.*” at the end of the file path, otherwise you will get an error.
 - ii. Note that there is a “Transfer in background” option in the Download dialog box that enables you to choose whether a download progress bar pops up once you start the download. We recommend leaving this box unchecked so that you can monitor progress.



8. Once you’ve entered your file path correctly (see above for example) click **OK** to begin the download.
 - i. As this zip file is downloading, you won’t be able to navigate to another folder within WinSCP.

9. Once the metadata zip file is done downloading, navigate to the folder where you downloaded the folder and unzip it using 7zip.
 - i. The metadata folder used for this exercise contains multiple subfolders, including a reports folder that provides detailed information on the acquisition and a shapefiles folder that contains area of interest (AOI) and tile layout shapefiles. Those shapefiles can be particularly useful for confirming that the data covers your forest or AOI.

Name	Date modified	Type
best_use_xml	6/29/2018 7:47 AM	File folder
breaklines	12/4/2018 11:06 AM	File folder
reports	6/26/2018 6:49 AM	File folder
shapefiles	11/29/2018 10:57 AM	File folder

Part 4: Download LAZ and DEM data

A. Download LAZ Data

1. Now that you've downloaded the metadata files for an acquisition, the next step is to begin the bulk download of LAZ files, which are zipped versions of LAS files.

Note: downloading large amounts of LAZ data from this FTP could take well over a day to finish.

2. If your WinSCP is still open to the metadata folder, go back a folder to the acquisition folder. You can navigate out of the metadata folder by either double clicking the uppermost folder icon (indicated below) or clicking a folder in the interactive file path above that icon.

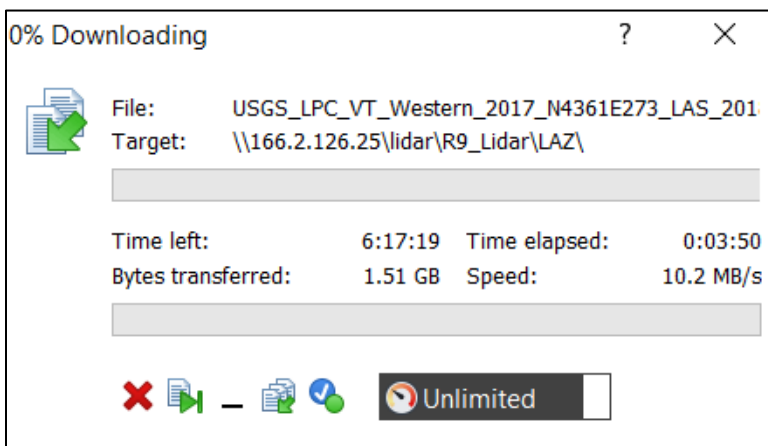
Name	Size	Changed
USGS_LPC_VT_Western_2017_LAS_2018.zip	426,144 KB	12/4/2018 4:...
USGS_LPC_VT_Western_2017_N4263E757_LAS_2018_meta.xml	12 KB	12/4/2018 3:...
USGS_LPC_VT_Western_2017_N4277E757_LAS_2018_meta.xml	12 KB	12/4/2018 3:...
USGS_LPC_VT_Western_2017_N4277E771_LAS_2018_meta.xml	12 KB	12/4/2018 3:...
USGS_LPC_VT_Western_2017_N4291E757_LAS_2018_meta.xml	12 KB	12/4/2018 3:...

3. Double click the LAZ folder to open it.
 - i. Note that the total file size of the LAZ folder contents as well as the total number of files are specified at the bottom of the WinSCP window.
4. To select all the LAZ files, click anywhere within the folder contents and then press Ctrl A.
5. With all of the LAZ files highlighted, click the **Download** button.
6. Navigate to or paste the output folder path where you would like to store the LAZ files.

Note: downloading over VPN will take a very long time and is generally not recommended. Instead, we recommend downloading data using a computer that is connected directly to the FS network. When working remotely, you can do this by establishing a remote desktop connection to a computer at your FS office.

Moreover, you'll need to keep track of data storage capacity when downloading the point cloud data, as a full acquisition can be hundreds of GBs. At GTAC, we usually download these large datasets directly to a network attached storage (NAS) folder where ample storage space is available.

7. Once you've entered the appropriate file path, press **OK** to begin the download.
 - i. The **Time left** tracker will fluctuate as the transfer speed (MB/s) changes.



B. Download DEM Data

1. Navigate to the original **Elevation** folder (/vdelivery/Datasets/Staged/Elevation/) where you initially connected to by either going back several folders using the previous folder icon or by clicking the **Elevation** part of the file path above the list of files.
2. In the Elevation folder, the **1m** folder contains all the standard 3DEP DEM products. These DEMs all have a spatial resolution of 1 meter and a UTM projection. The OPR folder also contains DEMs, but these are non-standard DEMs that are provided “as-is” from the vendor. Again, get in contact with the appropriate USGS National Map Liaison if you are struggling to find a particular acquisition folder.
3. Double click the **1m** folder and then double click the **Projects** folder.
4. Navigate to the folder you are interested in downloading and double click it.
 - i. You may notice that the naming conventions aren't necessarily the same in this 1m DEM folder as they were in the LPC folder.
5. Next, double click the **TIFF** folder to open it.
6. To select all the available TIFF rasters, click anywhere within the folder and then press Ctrl A.
7. Finally, click the **Download** button, select your desired output folder, and then click **OK**.

Congratulations! You have successfully completed this exercise. You now know how to use WinSCP to connect to the USGS FTP where they store all available 3DEP lidar data by acquisition. You can use these instructions to download the lidar point cloud files, DEMs and metadata for entire acquisitions at a time.