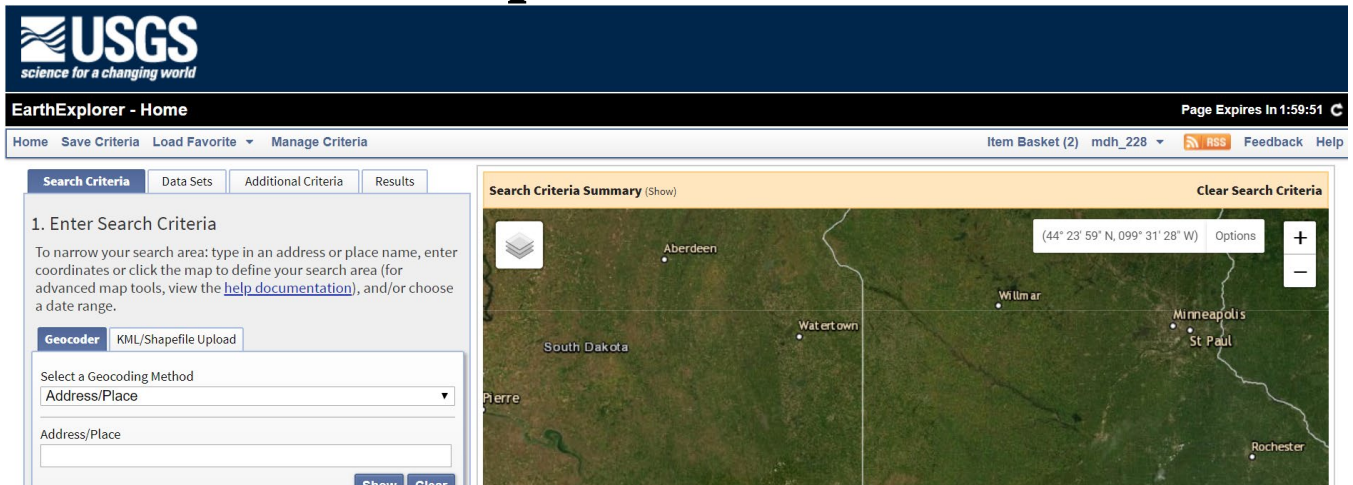


# Earth Explorer User Guide



## Introduction

Earth Explorer is one of the data gateway websites available from the United States Geological Survey (USGS). In order to utilize Earth Explorer, you will need to register an account with the USGS, which can be done for free. You can create shipping and billing information within your profile and update it whenever necessary. An advantage of Earth Explorer is the ability to create a standing order and save searches. These tools are very handy if you work with a study site or an area of interest for which you often search for data. Logging in also allows to define a search area using a shapefile or KML polygon.

## Available Data

- Landsat
- Sentinel-2
- SPOT
- High resolution commercial satellite
- SRTM DEMs
- AVHRR
- Various aerial photography



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## Part 1: Accessing the site

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A login in is required to download data; additionally, the USGS has arranged for US government users to directly download data from several sensors via a direct buy. See the CIDR User Guide for more details.

### A. Earth Explorer homepage

1. Open Earth Explorer by clicking this link: <https://earthexplorer.usgs.gov/>
2. If you already have an account with USGS, sign in. Otherwise, it is suggested that you create an account using the link on the upper right corner of the page, as one is required to download data.
  - i. Setting your affiliation to a government branch should allow access to the special data buy of commercial satellite imagery.
  - ii. Although a billing address is requested, note that most data is free through Earth Explorer for those logged on with a federal email account.
3. Once you are signed in, your username appears in the menu at the upper right of the page. You can update your shipping and billing addresses, as well as your contact information and your password by hovering over your username and clicking **Profile**.

## Part 2: Setting Search Criteria

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The interface will step you through the search setup process by progressing through the tabs, from left to right. You will not be able to set additional criteria until you select datasets. Also, you may not be able to progress to the Data Sets tab until you first set your search criteria.

The first step is to set your search area and define the time frame to search. There are several ways to define a search area: by drawing a polygon or circle directly on the map, by manually adding coordinates, by uploading a file, or by adding the current map view. All the methods are covered below, and you are encouraged to try each of them.

*You can define your search area using your mouse, a shapefile or a KML file (maximum 30 vertices). If you do not have a shapefile or KML file to use, you can use the sample files provided in the Obtaining Remotely Sensed Imagery tutorial.*

### A. Basic map navigation

Regardless of the search method used, these controls are consistent for all methods:

1. To **Zoom In**, roll your mouse scroll wheel **forward** or click on the “+” on the map zoom control.
2. To **Zoom Out**, roll your mouse scroll wheel **backward** or click on the “-” on the map zoom control.
3. To **Pan** around the map, click-hold the left mouse button and **move** your mouse.

### B. Address/Place

1. In the **Search Criteria** tab ensure that the **Geocoder** tab is selected (see figure below).
2. Enter an address or location (e.g., city, state, natural feature (lake, mountain, etc.)).

3. Click on **Show** to list all recognized locations with that name then click on the correct one.

### C. KML/Shapefile

1. Click the **KML/Shapefile Upload** tab

i. **Select KML/KMZ or Shapefile** from the drop-down menu (see below).

2. Navigate to the folder where your shapefile or KML is located.

**Note:** In order to use this feature, your **shapefile** must be in **Geographic coordinates (lat/long)**. Your shapefile must also be compressed into a single file using the ZIP archive file format and must contain a shape format file (.shp), shape index format file (.shx), and attribute format file (.dbf). A shapefile may also include an optional projection format file (.prj).

Earth Explorer can be temperamental with KML files. KML files that have previously been uploaded may not work in subsequent attempts.

3. Select the file and click **Open**.

i. You should now see your shapefile added to the map viewer.

### D. Date Range

1. Click the **Date Range** tab (see figure below), fill in the start date in the “**from**” box by either entering the date into the box in MM/DD/YYYY format, or click the **calendar** icon to the right of the box.

2. Set the ending date in the “**to**” box the same way.

3. Next to **Search months**, click on the dropdown box to select certain months to search within the range of years selected.
  - i. Click to remove the checkmark next to a month to exclude it from the search.
  - ii. Click again to return the checkmark and include the month in the search.
  - iii. If multiple months were removed, click next to **(all)** to return all months to be included in the search.
4. Click on the **Result Options** tab and set the maximum **Number of records to return** using the dropdown arrow.

### E. Review your search criteria

1. If all parts are correct, click on the **Data Sets** button (see figure below) at the bottom of the section.



## Part 3: Selecting Data Sets

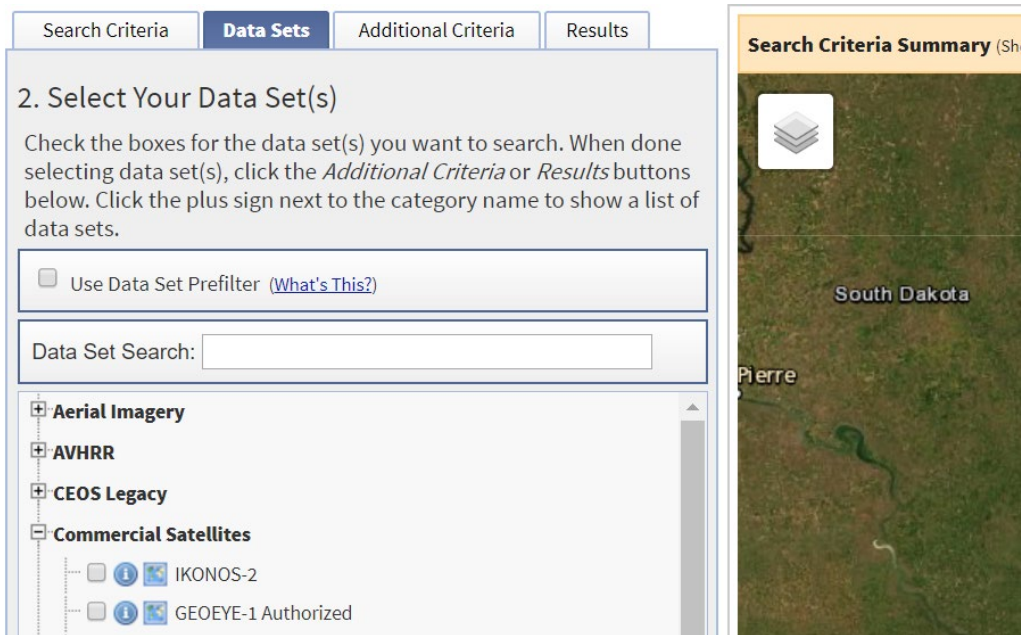
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### A. Select your dataset(s)

The next step is to choose which datasets to search through. This part will take you through how to select your datasets and how to refine the search parameters. While it may seem advantageous to select multiple datasets within an Area of Interest (AOI) in order to save time, this will add to the length of time the search will take. It is possible to return from the search results page and either further refine your search, or to select entirely different datasets, while still preserving your AOI. It is recommended that you keep initial choices to no more than three or four datasets to facilitate your search while using Earth Explorer. Note that you can also save your search criteria from the menu (see Section C in this Part).

*If you have created an account using your Forest Service address, you will have access to additional datasets. The datasets shown in the screen captures in this section were available at the time this document was created.*

1. A nice new feature of the revamped Earth Explorer site is the ability to remove datasets from the list if there are no data available over your AOI.
  - i. To activate this, click in the box to the right of **Use Data Set Prefilter** above the list of datasets. Depending on your AOI, the list should contain fewer datasets.



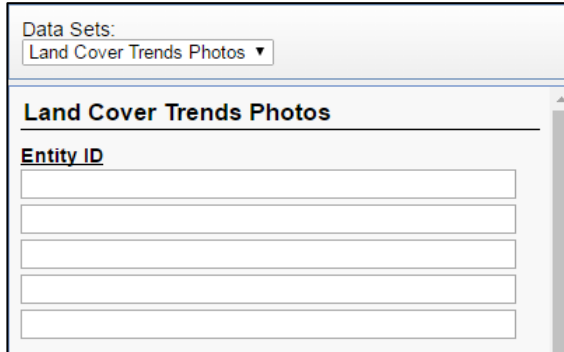
2. Click on the “plus sign” graphic next to a category to investigate the available data.
3. Click on the blue dot to the left of each dataset to open an informational webpage for that dataset in a new browser window.
  - i. The datasets available, and the cost associated with each, will depend on the affiliation of the logged in user.
4. The orange arrow graphic next to a dataset (see graphic below) will open a new window which shows links to where to find data no longer available through the Earth Explorer interface (such as DEMs and Landsat derivative products).



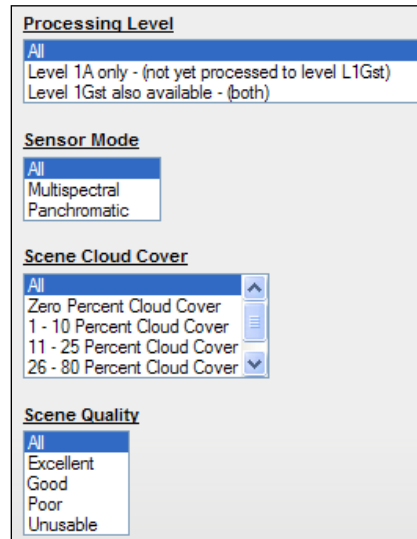
5. After identifying the desired dataset, select it by clicking in the box to the left of the name to place a checkmark.
6. Datasets can be deselected by clicking on the checkmark.

## B. Refining the dataset criteria

1. Click on the **Additional Criteria...** link below the dataset selection window. The **Additional Criteria** section will appear.
  - i. The criteria available will depend largely on the dataset selected. As an example, the Search Criteria box for Land Cover Trends Photos data is shown below.



- ii. For most sensors, if you know the scene identifier, you can enter it in this dialog. Some sensors also allow the use of wildcards to assist in narrowing down the results.
- 2. Select the amount of cloud cover for which you want to restrict the search. Cloud levels will depend on the sensor parameters. While Landsat restricts the choices to “Less than” values, some sensors allow the choice of ranges. You can select multiple ranges by holding down the Ctrl key while clicking.
- 3. Some sensors also allow the choice of sensor (panchromatic, multispectral, or both), or amount of correction/processing performed on the data. (See the example for SPOT below.)



- 4. To remove any criteria you have set, click the **Clear Criteria** button at the bottom of the window.
  - i. Clicking the **Clear All Criteria** button will reset your choices for ALL datasets. A warning dialog box will appear before resetting all choices.
- 5. To add or remove the selected sensors, click on the **Data Sets** tab.
- 6. To change the AOI, the number of results returned, or the range of dates, click on the **Search Criteria** tab.
- 7. Once you have selected all datasets and are satisfied with the criteria, click on the **Results** button at the bottom of the window (see graphic below.)

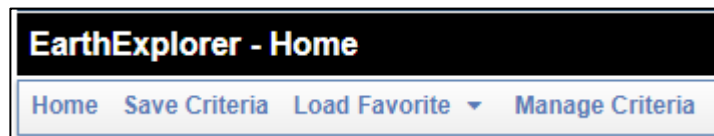
[Results »](#)

- i. If you choose to not set any additional criteria, you can click this immediately from the **Data Sets** tab.



### C. Setting up recurring searches

A feature of the Earth Explorer website is the ability to save your search, and to maintain a standing order. The latter is helpful when you need to be informed of when current data is made available for your AOI.

1. In the menu above the tabs and interactive map, there are a few options to save and access your searches (see graphic below; these will not be available if you are not logged in.)



2. **Save Criteria** will allow you to preserve the search criteria for this search. After clicking, a popup window will appear where you can name the criteria.
3. The **Manage Criteria** link allows you to manage saved criteria and standing requests.
4. The **Load Favorite** button will be empty unless you have saved a favorite search. To add a favorite, follow these steps:
  - i. Click on **Manage Criteria** button. Your **Saved Criteria** will appear.
  - ii. To make a set of criteria a favorite, check the box in the **Favorite** column.

Saved Criteria		
Saved Criteria Name	Favorite	Operations
tutorial	<input type="checkbox"/>	 

5. You can also do the following in the **Saved Criteria** section:
  - i. Click on the folder icon (the middle of the three icons) to load the criteria.
  - ii. Click on the red **"X"** to delete the criteria. Note that you WILL NOT be prompted to verify you want to delete it. It will disappear shortly after clicking the X.
6. Click on **Home** in the menu bar to return to the search screens.

## Part 4: Obtaining Data

### A. Reviewing results

When the search commences, the Results tab will become active, and results will begin populating the window. The steps below highlight the options available in this section and are not lettered/numbered as they are not necessarily to be done in order.

1. Access results from other datasets by clicking on the dropdown arrow under **Data Set:** toward the top of the window (see graphic below).

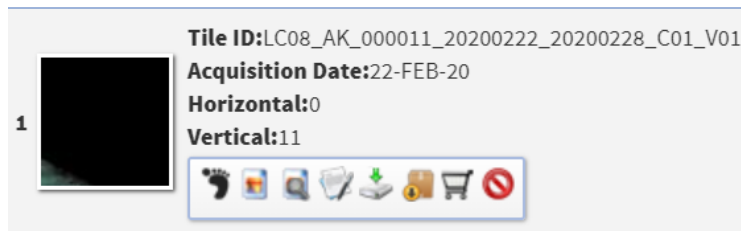




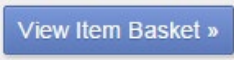
2. The results are typically presented in chronological order. Above the results (or below), click on the dropdown (see graphic below) to switch pages and view more results.



3. Click on the **Show Result Controls** heading at the top of your results window to:
  - i. Show all footprints for results on current page
  - ii. Show all browse images on the map (this may take a while depending on the results. Additionally, the opacity of the images can be adjusted.)
  - iii. Immediately add all of the images on this page of the results to your order or bulk download.
4. An example of a result is shown in the graphic below. Most data (particularly imagery) will have a thumbnail of the data to review. Clicking on this will open a new window with a larger, higher resolution version of the thumbnail.



5. At the top is the Tile ID for the data, followed by the acquisition date and the path/row info (when applicable).
6. The row of icons on the bottom, from left to right, are (note that all icons may not be present depending on the data):
  - i. **Show Footprint** for this file (clicking a second time will remove the footprint).
  - ii. **Show Browse Overlay** on the map for this file (clicking a second time will remove the browse).
  - iii. **Compare Browse** multiple results. Click **Show Result Controls** to compare selected images.
  - iv. **Show the Metadata and Browse** image (will appear in a popup window).
  - v. **Download Options**. This specifies the format and type of data to download
  - vi. **Add to Bulk Download**. This will create a list of bulk download files in your **Item Basket**.
  - vii. **Order the Scene** (This can also be toggled on and off). When you click this, the **Item Basket** icon in the top right will keep track of the total number of scenes you've selected to order. These order options are covered in more detail below.
  - viii. **Exclude Scene From Results**. This feature is useful to evaluate only the data of interest. Since only 10 records per dataset are displayed at a time, excluding those not of interest allow you to compare ten that may be of more relevance.
7. To save the current search criteria (but not any 'additional criteria') and receive notifications when more data from the selected sensors becomes available, click on the **Submit Standing Request** button below the search results.
  - i. Enter the required information in the popup window and click **Submit**.
  - ii. You must be logged in for this function to work, as it is saved with your profile.
  - iii. Hover over your username and click on **Settings** to get to your **Profile Overview**. Click **Order Tracking** in the left column to view the details or delete existing standing orders.
  - iv. When you are finished selecting data, click on the **View Item Basket** button (see graphic below) below your results or click Item Basket in the upper right next to your username.



## B. Ordering data

The **Item Basket** window will appear (see below).

## Order

*Note: Data sets may contain items with multiple product options. Exp*

▲ **U.S. Landsat 4-8 ARD** (1)

⊗ Remove All Scenes    🔧 Modify Options For All Scenes

**LC08\_AK\_000011\_20200222\_20200228\_C01\_V01**

**Title ID:** LC08\_AK\_000011\_20200222\_20200228\_C01\_V01

**Acquisition Date:** 22-FEB-20

**Horizontal:** 0

**Vertical:** 11

**Product:** ARD TILE WMS ONDEMAND ▼

**Options:** None

**Output Media:** DWNLD

1. Click on the down arrow to the left of the dataset name to see the product details. Note that there are two sections displayed: **order** and **bulk download**.
2. If you change your mind about downloading everything listed, click on the **Remove All Scenes** button above the full scene name.
3. To the right of that, you can click on **Modify Options for All Scenes** to change any options. Note that each scene detail section lists what options are available.
  - i. In the example in the graphic above, the Landsat scene has no options available.
4. To remove an individual scene, click on the “X” to the far right of the Tile ID.
5. If you have selected data from multiple sensors, each will have its own heading. Click on the **collapse** button to the far right of the Scene ID to create more room to see other datasets.
6. Click on **Proceed to Checkout** at the bottom of the window to continue. The checkout summary window will appear with details about your order.
  - i. You will receive an email when your data is ready to be downloaded. It will also contain instructions on how to obtain your data.
  - ii. If you ordered Landsat data which has not yet been pre-processed (the **Download Options** icon will not be present in the Results section), it will take some additional time for your data to become available.

*If you need to download many scenes, it's best to use the [Bulk Download Tool](#) which facilitates a faster download process for scenes that are available.*