

GEO 542: Introduction to Remote Sensing – Fall 2025

Workshop1: EarthExplorer Imagery into Catalyst Professional

Now that you have learned how to download data from EarthExplorer, you need to be able to use them in image processing software. This workshop addresses image processing procedures should metadata files not be available.

If we used the following criteria in an image search on EarthExplorer: Calgary, Alberta for the month of June from 2009 to 2011 from the Landsat Collection 2 Level-1 selected and less than 10% cloud cover.... the following result occurs.

Select a Geocoding Method
Address/Place (Google)

Address/Place (Google)

Show Clear


Click on an Address/Place to show the location on the map and add coordinates to the Area of Interest Control.


Num	Address/Place	Latitude	Longitude
1	Calgary, AB, Canada	51.0447	-114.0719

Landsat

+ Landsat Collection 2 Level-3 Science Products
+ Landsat C2 U.S. Analysis Ready Data (ARD)
+ Landsat Collection 2 Level-2
- Landsat Collection 2 Level-1

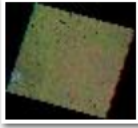
☐ Landsat 8-9 OLI/TIRS C2 L1
☐ Landsat 7 ETM+ C2 L1
☒ Landsat 4-5 TM C2 L1
☐ Landsat 1-5 MSS C2 L1








Data Set [Click here to export your results »](#) 

Landsat 4-5 TM C2 L1 

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 ID: LT05_L1TP_042024_20100613_20200824_02_T1
Date Acquired: 2010/06/13
Path: 042
Row: 024
























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By downloading the image, you would have received the file:

LT05_L1TP_042024_20100613_20200824_02_T1.tar

It is now necessary to unzip this file and extract the data files contained within it.
Right click on the file and select Extract All...

The files are normally extracted to your default directory
C:\Users\yourusername\Downloads\LT05_L1TP_042024_20100613_20200824_02_T1
although you can normally specify an alternate directory. Once unzipped, you should have a series of files that appears like this:

Name	Date modified	Type	Size
▼ Today			
 LT05_L1TP_042024_20100613_20200824_02_T1_stac.json	2025-09-17 16:22	JSON File	46 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_thumb_large.jpeg	2025-09-17 16:22	JPEG File	80 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_thumb_small.jpeg	2025-09-17 16:22	JPEG File	9 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_VZA.TIF	2025-09-17 16:22	TIF File	4,292 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_VAA.TIF	2025-09-17 16:22	TIF File	8,944 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_VER.jpg	2025-09-17 16:22	JPG File	422 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_VER.txt	2025-09-17 16:22	Text Document	95 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_QA_RADSAT.TIF	2025-09-17 16:22	TIF File	305 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_SAA.TIF	2025-09-17 16:22	TIF File	2,857 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_SZA.TIF	2025-09-17 16:22	TIF File	2,698 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_GCP.txt	2025-09-17 16:22	Text Document	38 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_MTL.json	2025-09-17 16:22	JSON File	10 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_MTL.txt	2025-09-17 16:22	Text Document	11 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_MTL.xml	2025-09-17 16:22	Microsoft Edge HTM...	16 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_QA_PIXEL.TIF	2025-09-17 16:22	TIF File	896 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_B7.TIF	2025-09-17 16:22	TIF File	37,415 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_B6.TIF	2025-09-17 16:22	TIF File	18,779 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_B5.TIF	2025-09-17 16:22	TIF File	42,424 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_B4.TIF	2025-09-17 16:22	TIF File	35,929 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_B3.TIF	2025-09-17 16:22	TIF File	31,475 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_B2.TIF	2025-09-17 16:22	TIF File	26,418 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_B1.TIF	2025-09-17 16:22	TIF File	31,252 KB
 LT05_L1TP_042024_20100613_20200824_02_T1_ANG.txt	2025-09-17 16:22	Text Document	35 KB

The image data files end with the .tif extension. Metadata can be found in the files ending with .txt.

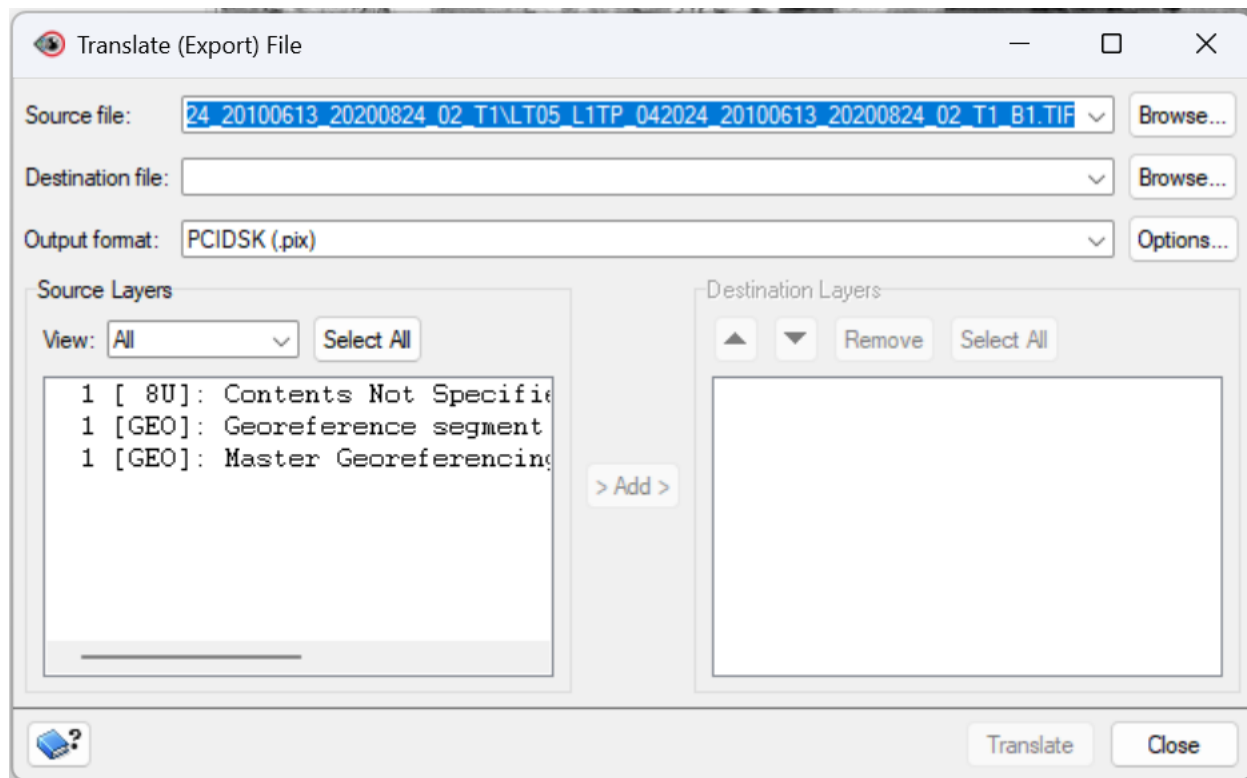
Open Catalyst Professional and bring the first .tif file into the software. This represents Band1 of the Landsat image. The full file name is:
LT05_L1TP_042024_20100613_20200824_02_T1_B1.TIF.

You need to turn the .tif files into a standard Catalyst (PCIDSK) .pix file that contains all of the bands or layers in the image.

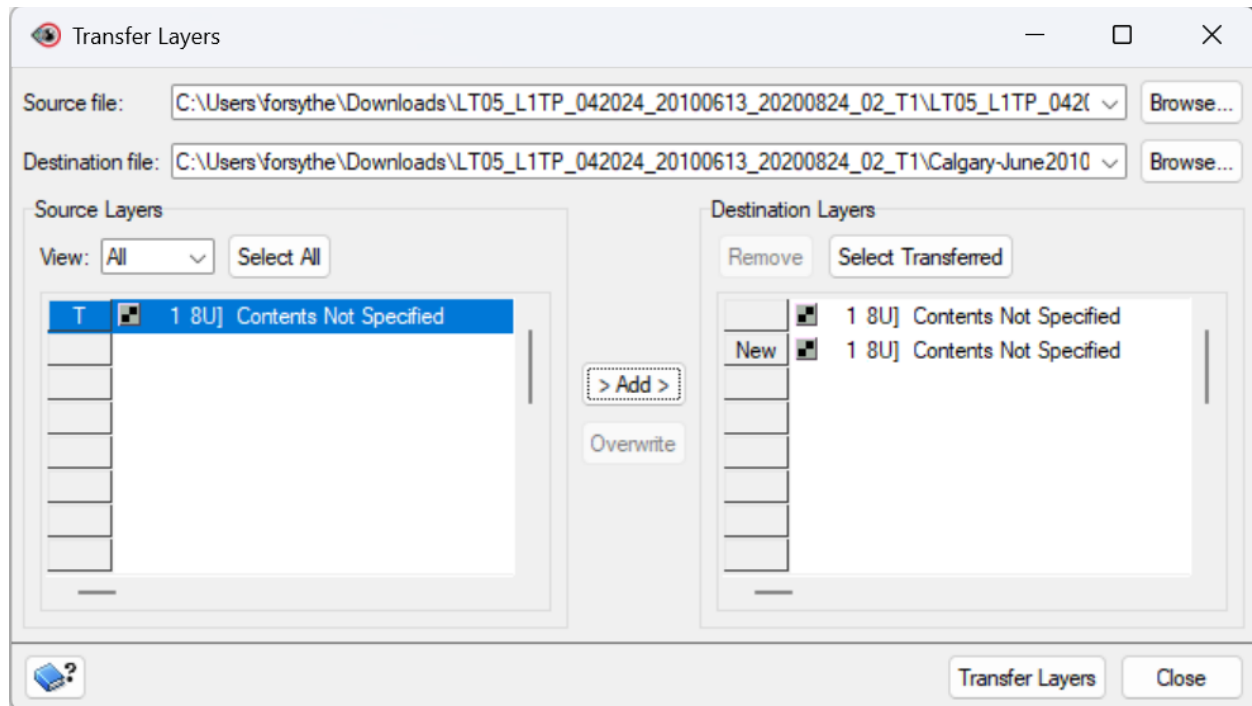
To do this, first take the Band1 file and use the following command:

File-Utility-Translate...

You should get a dialogue box that appears similar to what is below.



After this, you can sequentially add the other Bands to this file using the File-Utility-Transfer Layers... command:




It is important that you transfer the bands in order. First add LT05_L1TP_042024_20100613_20200824_02_T1_B2.TIF and then LT05_L1TP_042024_20100613_20200824_02_T1_B3.TIF and so on. You can skip adding Band 6 as this is the thermal band and it has a 120m spatial resolution as compared to the 30m spatial resolution of all the other bands. Remember that you need to specify files with a **.pix** extension as the Destination File.

The image should look like this when you zoom in on downtown Calgary:



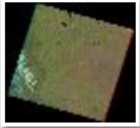
Now download a Landsat 7 image from June 2002

Data Set [Click here to export your results »](#) 


Landsat 7 ETM+ C2 L1

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ID: LE07_L1TP_042024_20020615_20200916_02_T1
Date Acquired: 2002/06/15
Path: 042
Row: 024



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and one from June 2009 (Path 42 Row 24).

Data Set [Click here to export your results »](#) 


Landsat 7 ETM+ C2 L1

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ID: LE07_L1TP_042024_20090602_20200912_02_T1
Date Acquired: 2009/06/02
Path: 042
Row: 024



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You can utilize the Data Merge command to create the .pix image files.

Examine the image differences due to the failure of the Scan Line Corrector (SLC) in May 2003.