National Aeronautics and Space Administration

Homework 2: Obtain and Prepare a Landsat Image Covering Rock Lake and Geneva Lake in Wisconsin

Objectives

- Install OCSSW in SeaDAS for processing Landsat-8 OLI images
- Download Landsat-8 OLI Level-1 image using the USGS Earth Explorer (https://earthexplorer.usgs.gov/) for selected lakes in Wisconsin

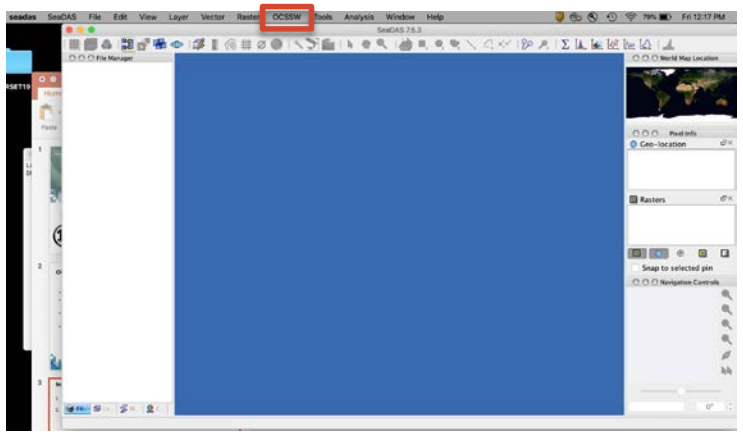
Prerequisite

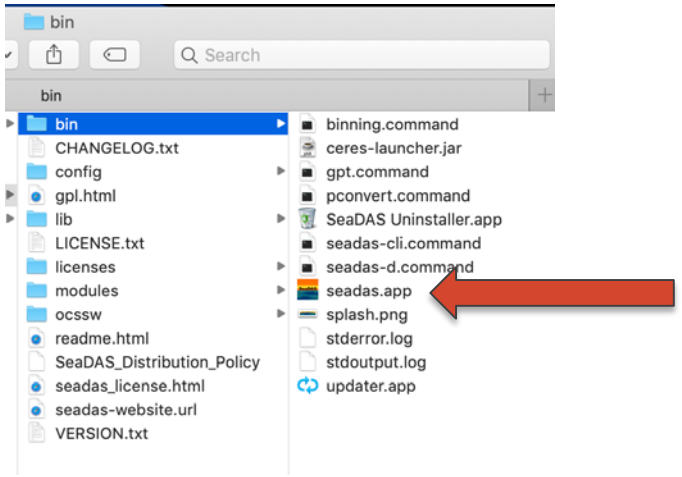
- This Homework exercise requires installation of SeaDAS software on your computer

- Please go to https://seadas.gsfc.nasa.gov/ to download and install the software
  – [https://arset.gsfc.nasa.gov/sites/default/files/water/18-WQIP/WQweek2.pdf]

Install OCSSW in SeaDAS for Processing Landsat-8 OLI Images

1. Open SeaDAS on your computer by clicking on SeaDAS.App
2. You will get the SeaDAS Window

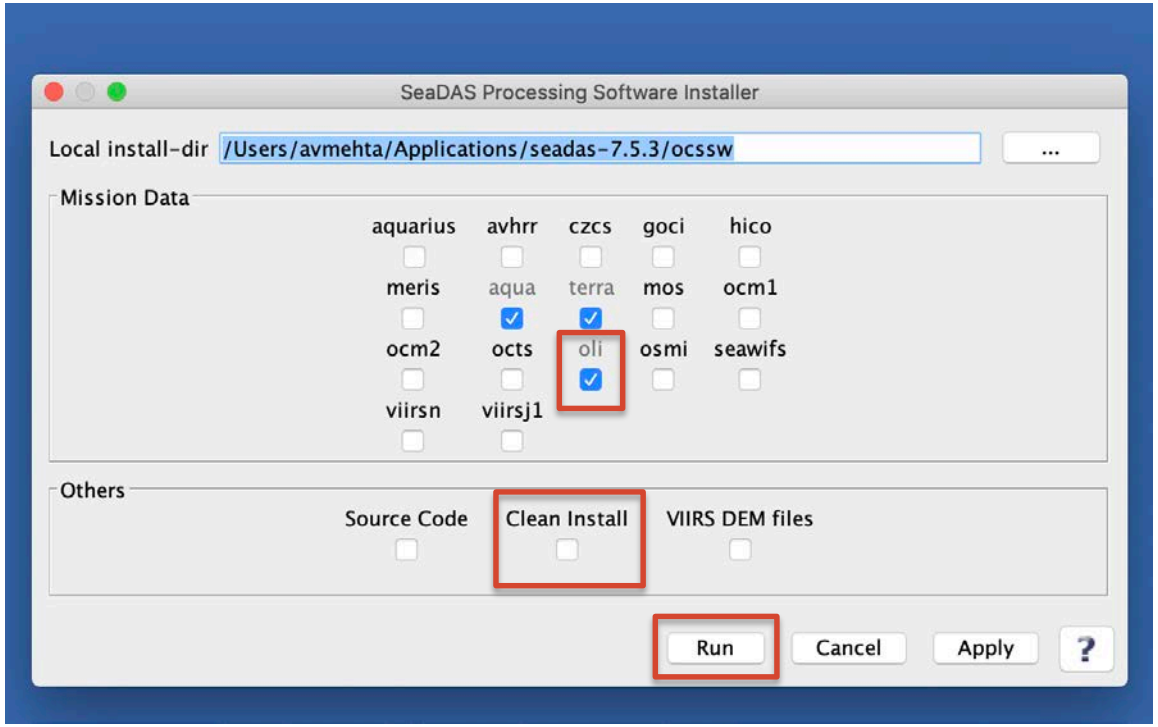




3. On the top bar find OCSSW and click
4. Click on **Install** or **Update Processors**

Install OCSSW in SeaDAS

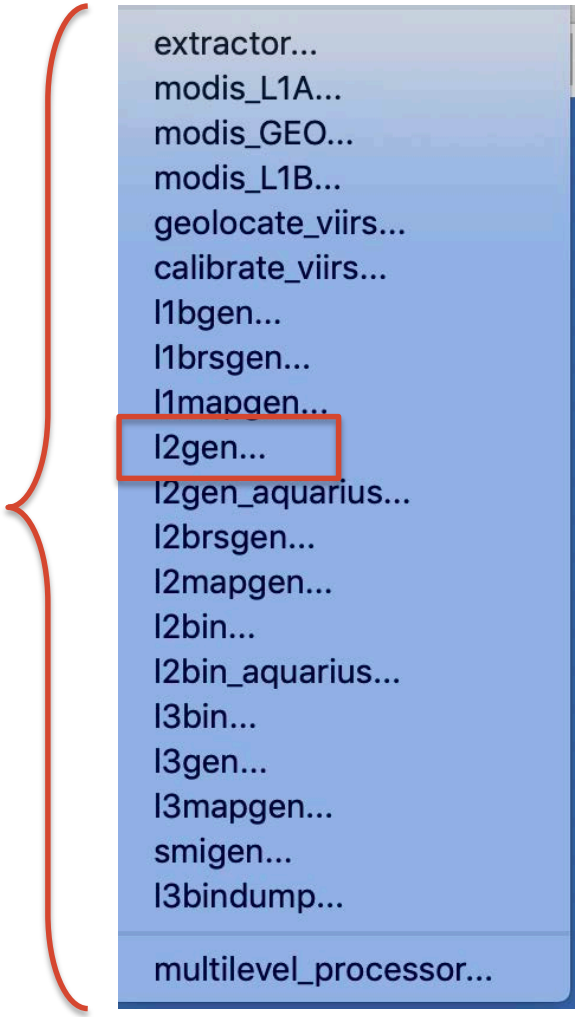
5. You will get the **SeaDAS Processing Software Installer** window
6. Select OLI by checking the corresponding box you may also choose to install **Aqua** and **Terra** for MODIS processing
7. Select **Clean Install** option under **Others**
8. Click on **Run** at the Bottom
9. It will take some time to install the software



Install OCSSW in SeaDAS

10. Once OCSSW is installed, you will be able to choose processing options
11. We will use **l2gen** in this exercise to generate a Level-2 image from a Level-1 OLI image

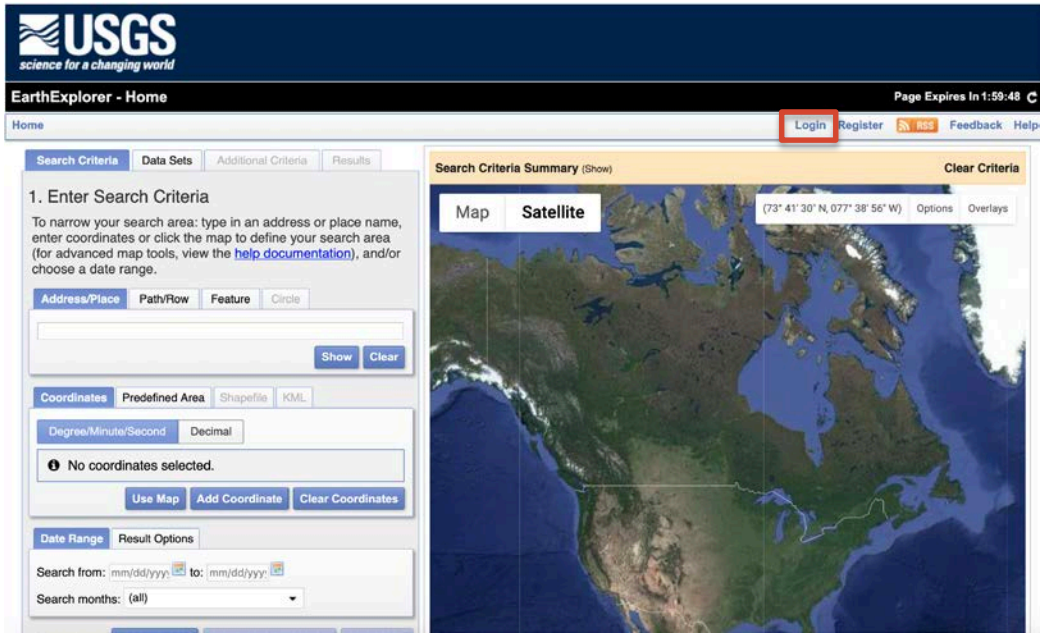
OCSSW Processing Options

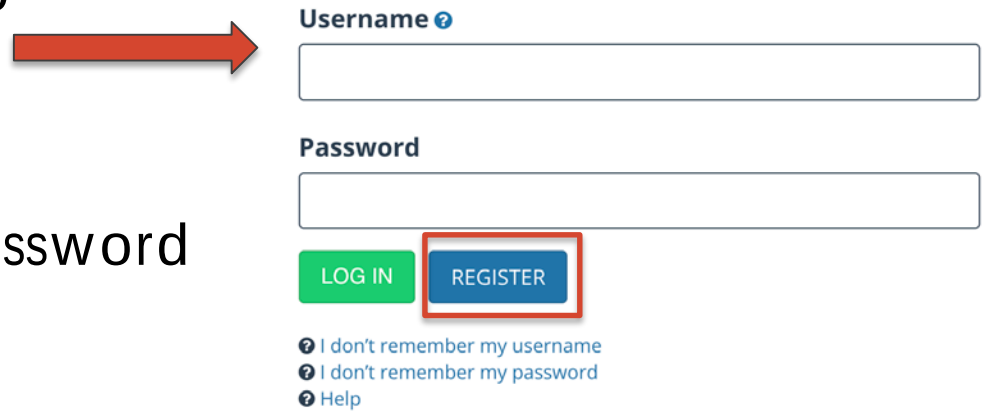


Select Landsat-8 OLI Level-1 Image

https://earthexplorer.usgs.gov/

12. First register on NASA Earth data to be able to access data from the EarthExploerer (EE)
13. Go to EE: https://earthexplorer.usgs.gov/
14. Login with NASA Earthdata Username and Password

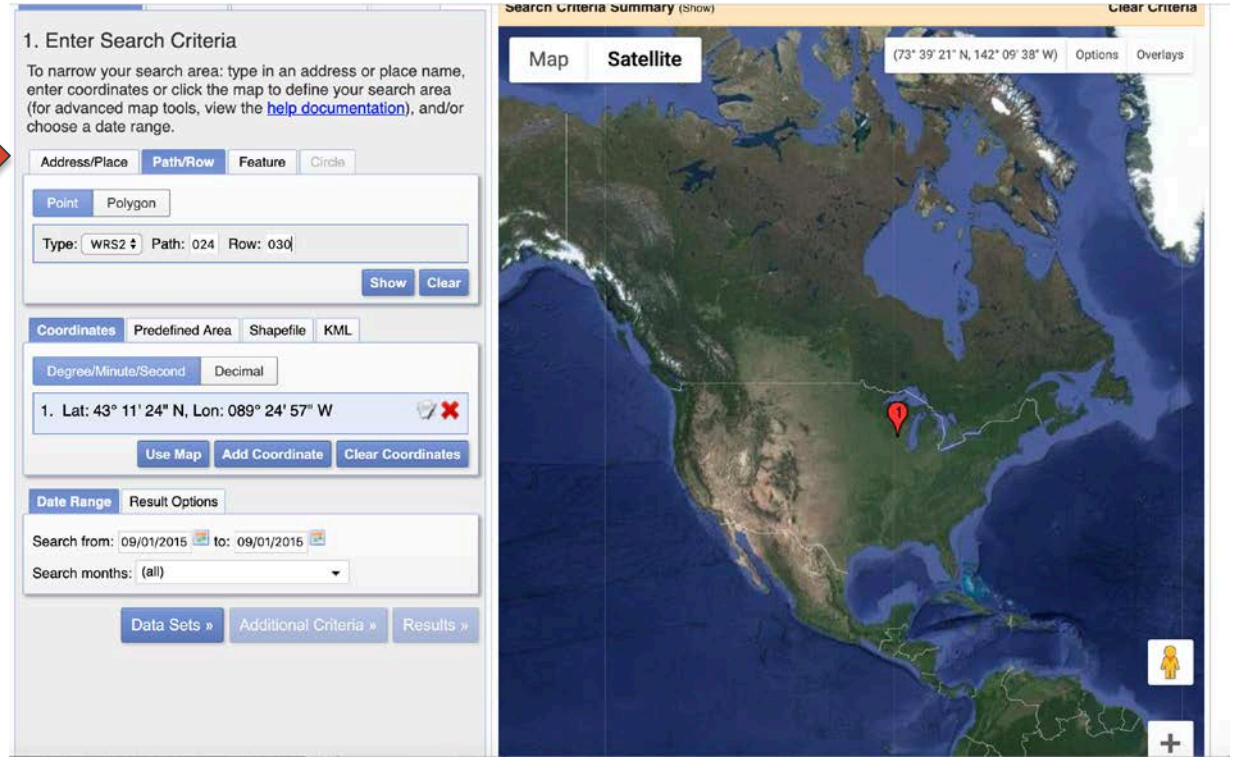




Select Landsat-8 OLI Level-1 Image

https://earthexplorer.usgs.gov/

15. In the **Enter Search Criteria** window, click on **Path/Row**
16. Under **Path** > **Type** enter **024** in the **Path** window and **030** in the **Row** window
17. Click on **Show** below the selection box. The point will be shown on the map
    - Note: These paths/rows correspond to an area in Wisconsin*

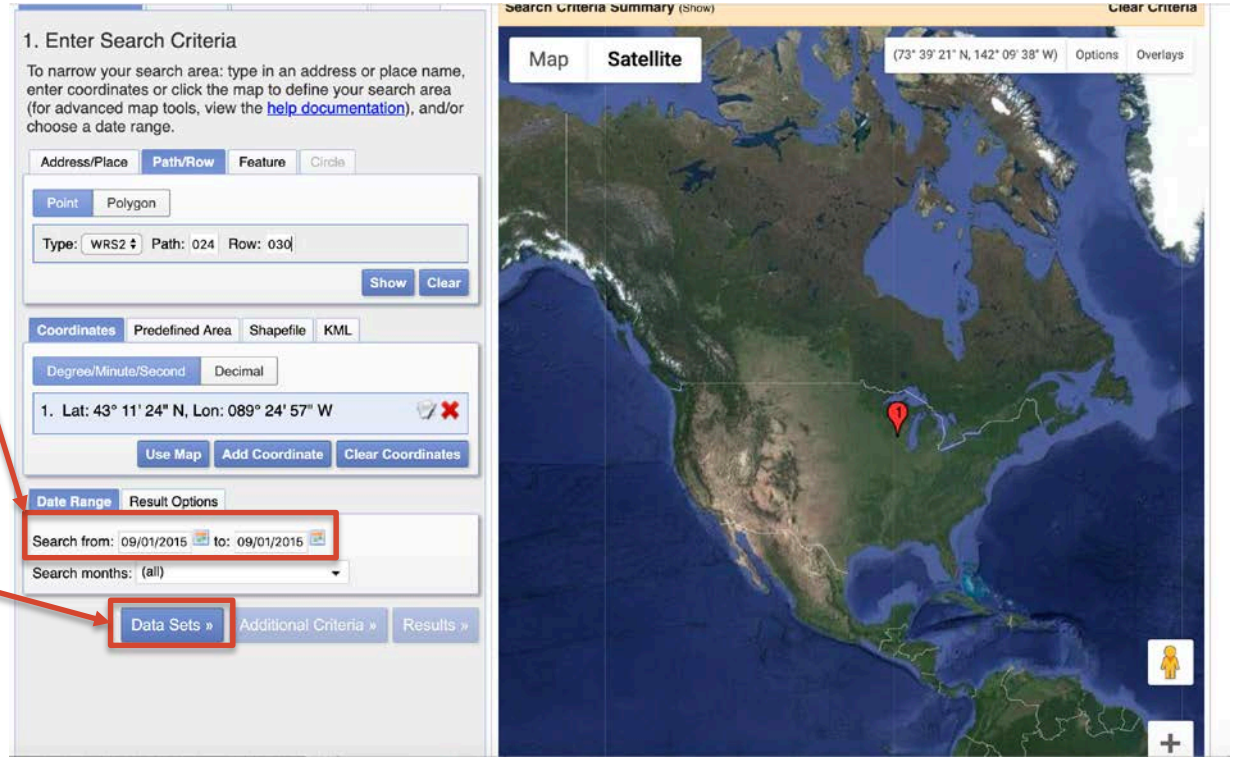


*In the future, if you do not know the path/row, then you can enter coordinates or create a polygon on the map

Select Landsat-8 OLI Level-1 Image

https://earthexplorer.usgs.gov/

18. Click on the **Date Range** using the calendar. Set the **Search From** and **To** dates to both be 09/01/2015
    - This date corresponds to the in situ measurements of Rock Lake and Geneva Lake in Wisconsin
19. Click on the **Data Sets** option

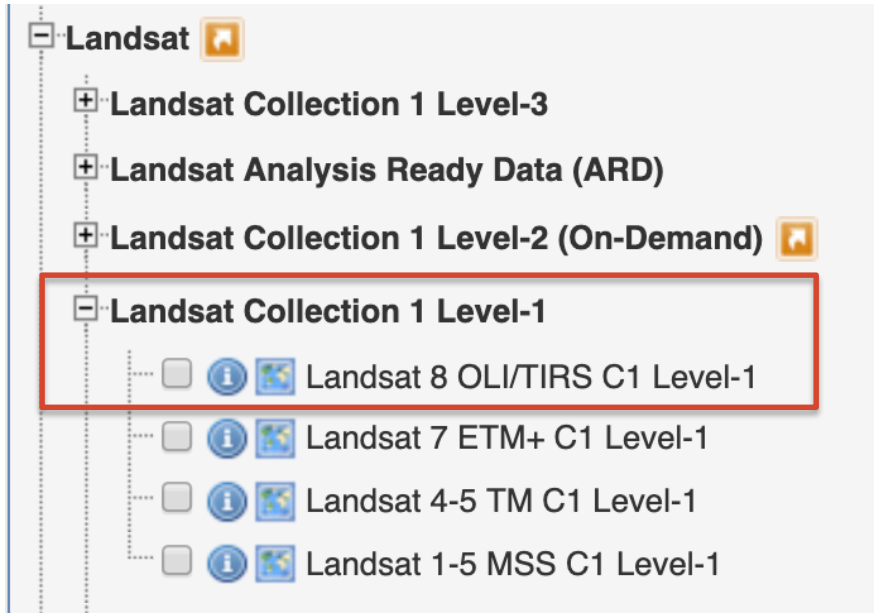


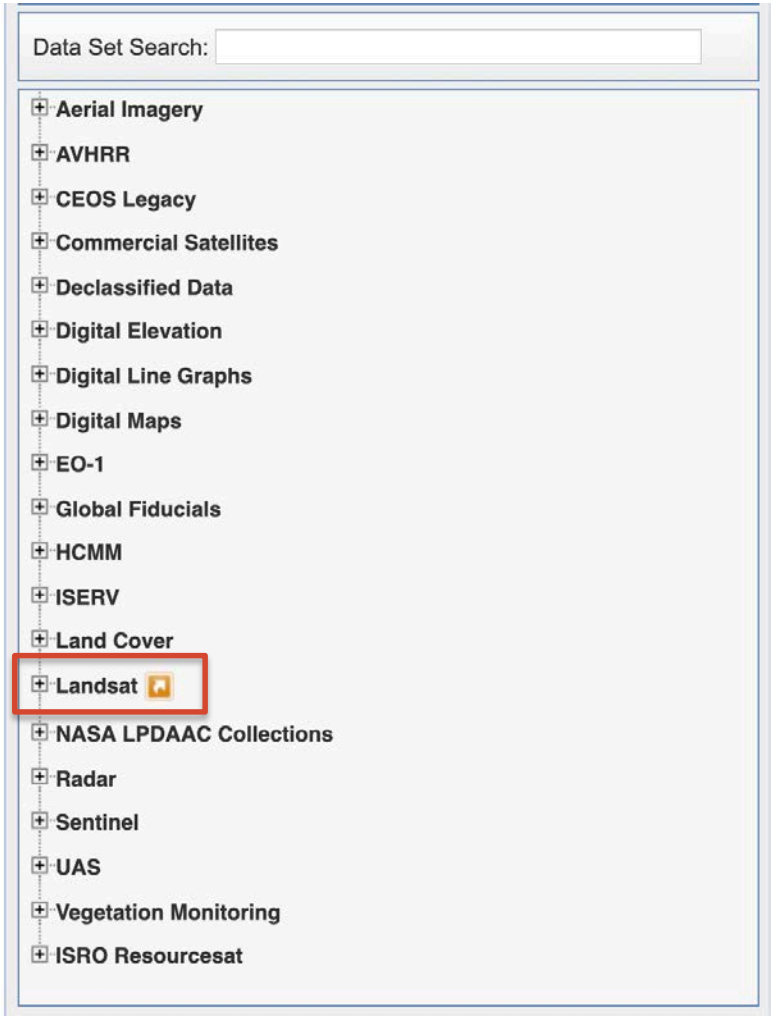
Download Landsat-8 OLI Level-1 Image

https://earthexplorer.usgs.gov/

- You will get a table of dataset options

20. Select **Landsat** > **Landsat Collection 1 Level-1** > **Landsat 8 OLI/TIRS C1 Level-1**

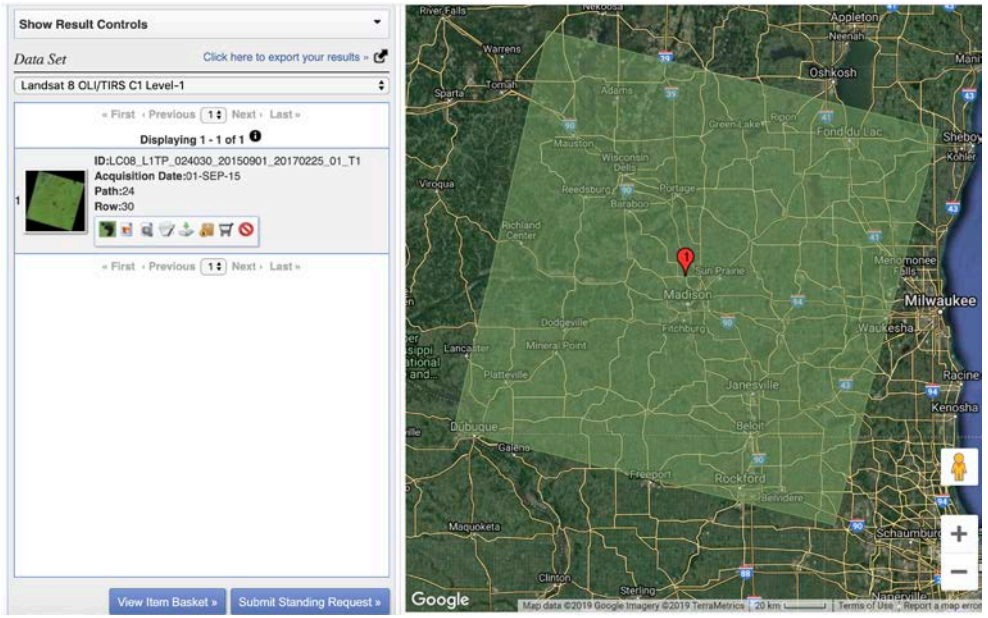


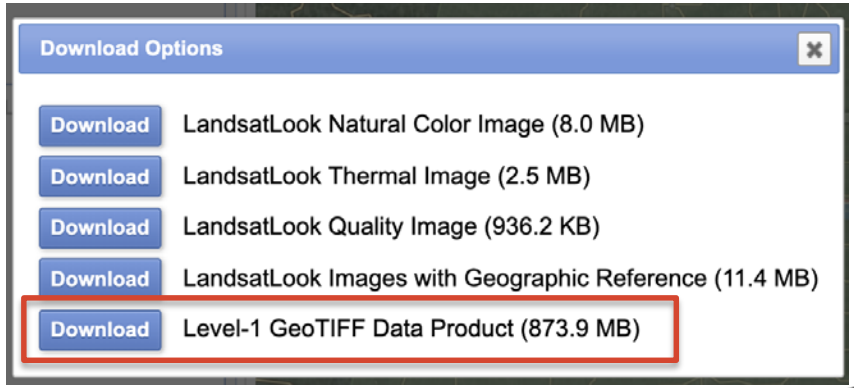


Download Landsat-8 OLI Level-1 Image

https://earthexplorer.usgs.gov/

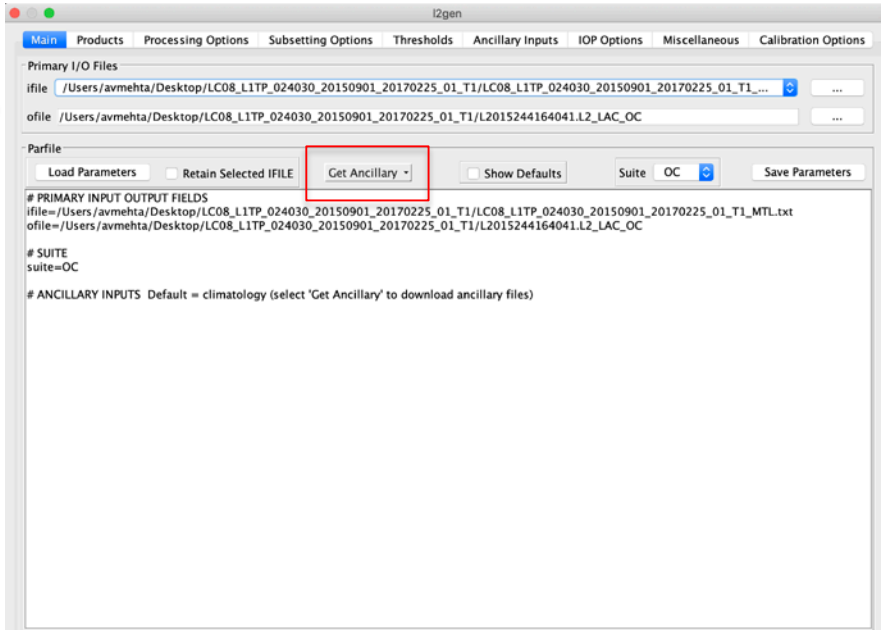
21. Click on **Results**
22. You will see the selected image in the **Data Set** window on the left. Click on the footprint to see the image on the map
23. Click on the download symbol to get download options
24. Select **Level-1 GeoTIFF Data Product** and save the file to your computer





Generate Level-2 OLI Image Using SeaDAS - OCSSW

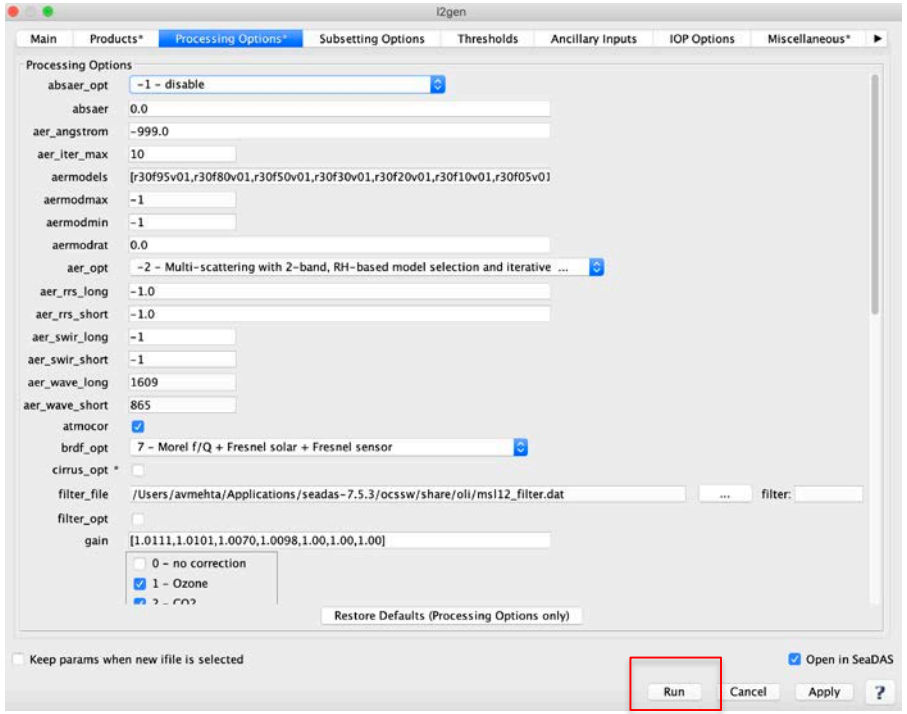
18. You will get the Landsat OLI Image in zipped (.gz) folder. Click on the folder to get uncompressed data files in a folder
19. For **ifile** navigate to the unzipped image folder and selectthe file LC08_L1TP_024030_20150901_20170225_01_T1_MTL.txt
20. Open SeaDAS and click on OCSSW on the top.
    - Select **l2gen** from the list
    - An l2gen window will open
    - Click on **Get Ancillary**
    - Click on **Products** on the top bar and explore the default and other Level-2 products being generated



- Make sure in the **Products Selector t**he following are selected:
  >Radiances/reflectances→ Rrs
  > Derived Geophysical Parameters → chlor-a & Kd

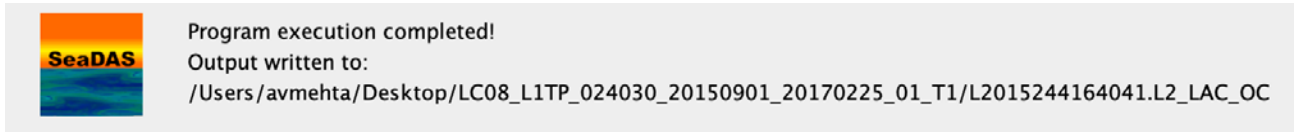
Generate Level-2 OLI Image Using SeaDAS - OCSSW

- Click on Processing Options on the top bar
- You will get a window with various options
- Because we want to detect and include small possibly turbid lakes in the image we will change the following default options by using the drop down options
  - > **aer_opt = -99 – No aerosol subtraction**
  - > scroll down and **maskcloud** and turn it off (the box next to it should be blank)
  - > Turn off **maskhilt**
  - > Turn off **maskland**
  - > Scroll down to **proc_ocean** and select **2 force all pixels to be processes as ocean**
  - > Click **Run** at the bottom

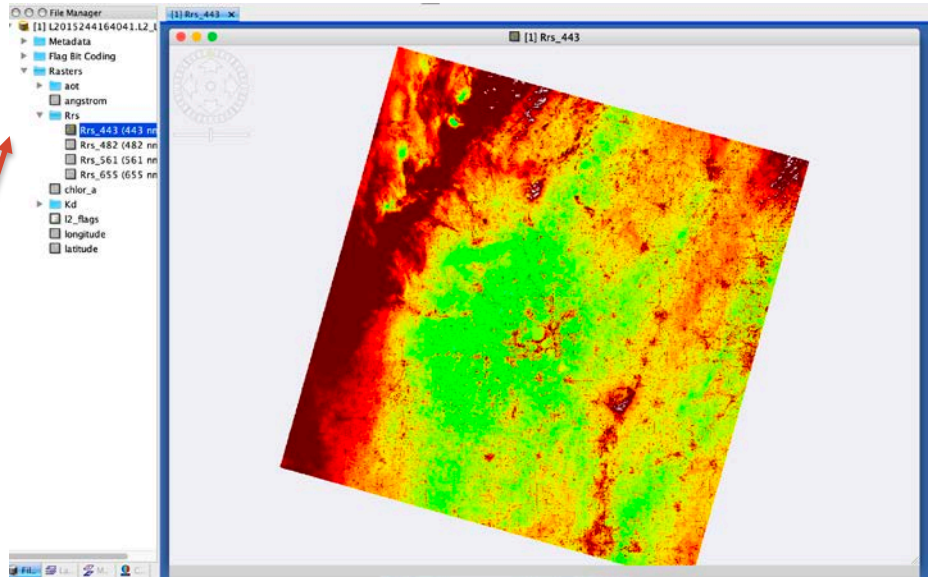


Generate Level-2 OLI Image Using SeaDAS - OCSSW

21. The process of getting level-2 products can take up to 15-20 minutes or more. After the completion you will see the following message:



22. You will get the Level-2 data. By clicking on the rasters you can view the data



We will analyze this Level-2 data in Week-3