Exercise 2 – Acquiring Spatial Data Online

Session Objectives: At the conclusion of this session, you will be able to:

- ❑ Identify online sources to obtain GIS Data
- ❑ Download imagery using Earth Explorer

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Software: ArcGIS 10, SP5

Directory Path: C:\ or D:\CSP7200\Exercise2

GDB:

Imagery:

MXD:

Searching the internet for GIS data is easy, but don't let the cart get before the horse. First make a list of what data sets or imagery you need and then perform the search. It's easy to fill-up hard drives with gigabytes data that are rarely used because the resolution is too coarse (i.e. You found a 30 meter DEM, but needed 3 meter for the analyses) or the data quality is unknown (i.e. no metadata).

There are many websites to obtain free GIS data for the United States, but very few that cover the geographical extent of the Maldives. This is especially true if you're looking for fine resolution raster and vector data sets. If you can't find anything useful on the web, another option is to check with your local cooperating agencies to see if they have acquired GIS data for internal projects. You could find a wealth of useful data. If this fails, then you will need to 1) purchase the data from a vendor if it already exists, 2) hire a vendor to create the data if none exists or 3) create the data yourself via heads-up digitizing or field mapping with GPS units.

All data are located in CSP7200\Exercise2, unless otherwise stated.

This exercise shows you how to obtain free imagery from EarthExplorer, which is managed by U.S. Geological Survey (USGS). EarthExplorer has a simple interface and the largest collection of free downloadable GIS datasets.

TASK 1 – Explore the Available Data Types

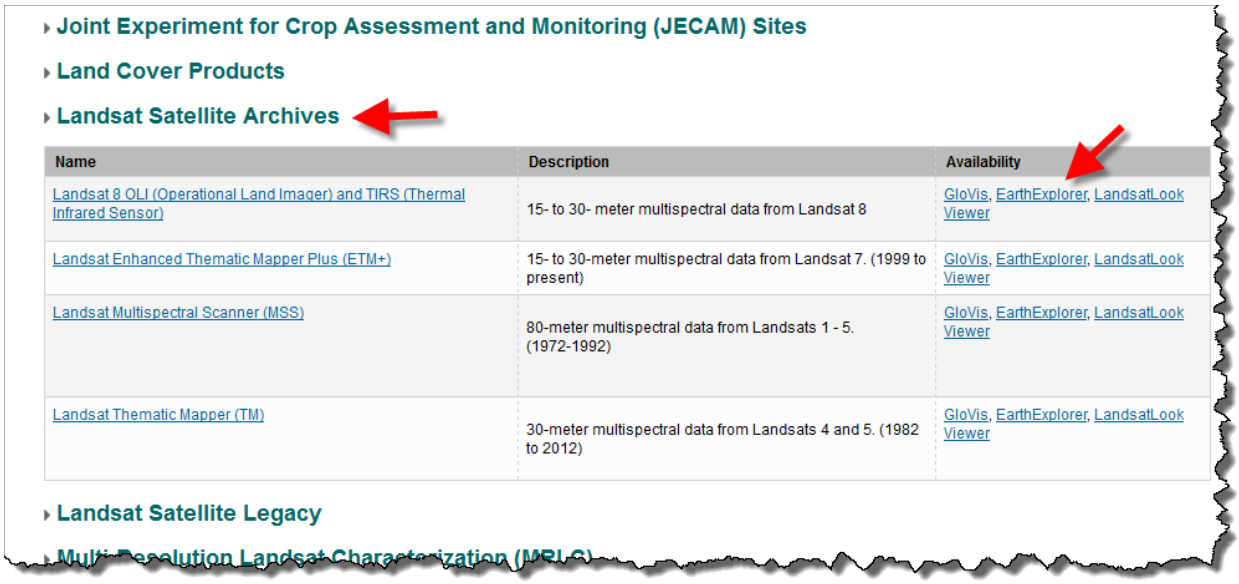
1. Launch a web browser and navigate to the USGS products overview page.

   https://lta.cr.usgs.gov/products_overview

2. Take 10 minutes and explore the available data types, but don't go to the associated links just yet.

TASK 2 – Download Landsat 8 Satellite Imagery

1. Select the Landsat Satellite Archives data type and click on the EarthExplorer link for Landsat 8 OLI.



2. Login to the site using the following credentials listed below. You can create your own login later if you wish, but I've created one for the class to use.

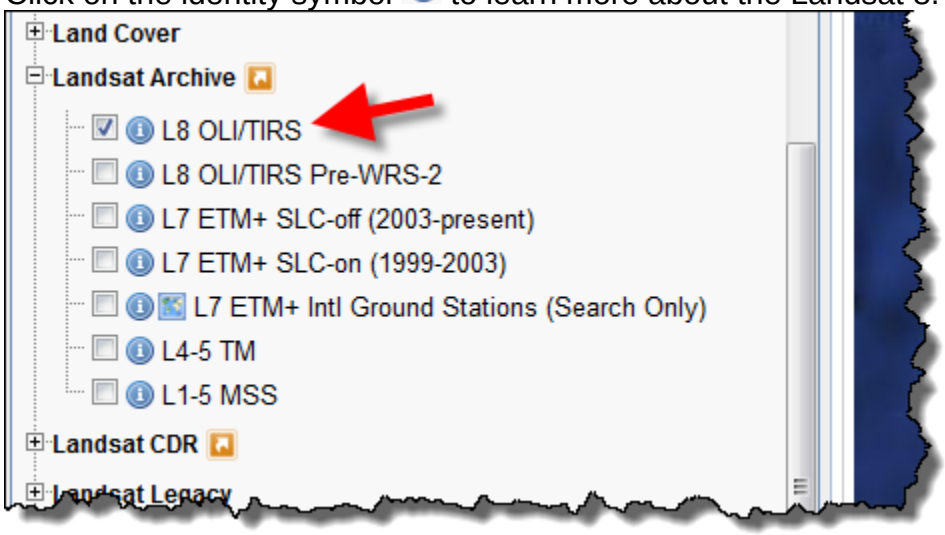
User name: **veg mapping**
Password: **nctc2013**

3. Locate the Maldives on the map and add a marker on the Island of Male. To pan, simply hold down the left mouse button and move the mouse. To zoom-in, scroll forward on your mouse. To add a marker, simple left-click on Male.

4. Click on the Data Sets button

on the bottom left of the dialog.

5. Maximize the Landsat Archive data set and check the **L8 OLI/TIRS** box. Click on the identity symbol to learn more about the Landsat 8.

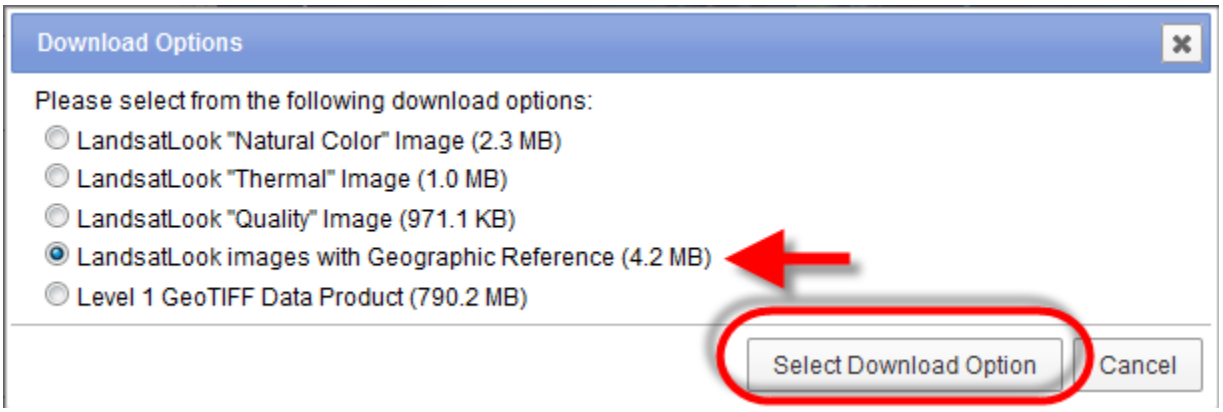


6. Select the Results button

to see what's available for our location of interest.

7. Select the download button for the first scene.

8. Select the download option shown below. This will give us a natural color image that has been projected.



9. Click on the Select Download Option button and Download again.

10. Save the zip file in your Downloads folder.

11. Extract the files and save them the Exercise2 folder.

12. Open ArcMap and view the data. Do you think this data is useful if the purpose was to overlay GPS data? What do you think you could use this imagery for?

TASK 3 – Search and Download Other Data Types from EarthExplorer

1. Go back to EarthExplorer, search for and download other data types that may be useful for your GIS needs.

NOTE: EarthExplorer provides other ways to identify the search area in addition to using a single point/coordinate on the map.

1. You can use Path and Row to find more Landsat 8 data. The KML file of the path/row data can be downloaded here: http://landsat.usgs.gov/tools_wrs-2_shapefile.php or found in the Exercise 2 folder already,

2. Add a shapefile or KML file to define the area,

3. Or click Use Map to assign the extent as the search area.

Links to Learn More About Landsat 8 Satellite Imagery

Good introduction to Landsat 8 - http://www.shadedrelief.com/landsat8/introduction.html

Everything Landsat - http://landsat.usgs.gov/index.php

Landsat 8 band combinations (ESRI) - http://blogs.esri.com/esri/arcgis/2013/07/24/band-combinations-for-landsat-8/

Landsat 8 product descriptions - http://landsat.usgs.gov/documents/LDCM-DFCB-004.pdf

Global GIS Data Sources

Cornell University - http://mannlib.cornell.edu/research-help/gis/gis-data

Global Coral Reef Data and Resources - http://www.reefbase.org/main.aspx (registration required)

NASA Earth Data - https://earthdata.nasa.gov

SRTM DEM data - http://srtm.csi.cgiar.org/

Geodata Platform - https://www.geoplatform.gov/

Geocommons - http://geocommons.com/

DataBasin - http://databasin.org/