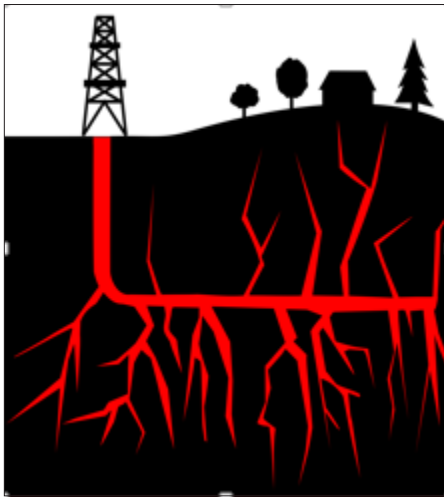


# Monitoring fracking in Denton, TX

## Use panchromatic Landsat

Fracking is a well stimulation technique. Fracking involves the high-pressure injection of water or other products into a well. This injection creates cracks in deep-rock formation that allow the release of natural gas and petroleum more easily. Fracking's pros and cons have been widely debated. The process of hydraulic fracturing is highly controversial, with one side heralding the economic benefits and the other side weighing in on the potential environmental impacts of increasing earthquake activity. The town council of Denton, TX, passed a city referendum in 2014 to prohibit hydraulic fracturing. This referendum was rescinded when the state of Texas passed a bill that prohibited the banning of fracking.



### Build skills in these areas

- ▶ Using Esri Landsat Explorer app
- ▶ Visualizing data using band combinations
- ▶ Filtering and selecting specific dates to analyze and compare
- ▶ Investigating change with time-enabled data
- ▶ Interactively comparing two images using a swipe tool
- ▶ Creating a story map of the temporal images

### What you need

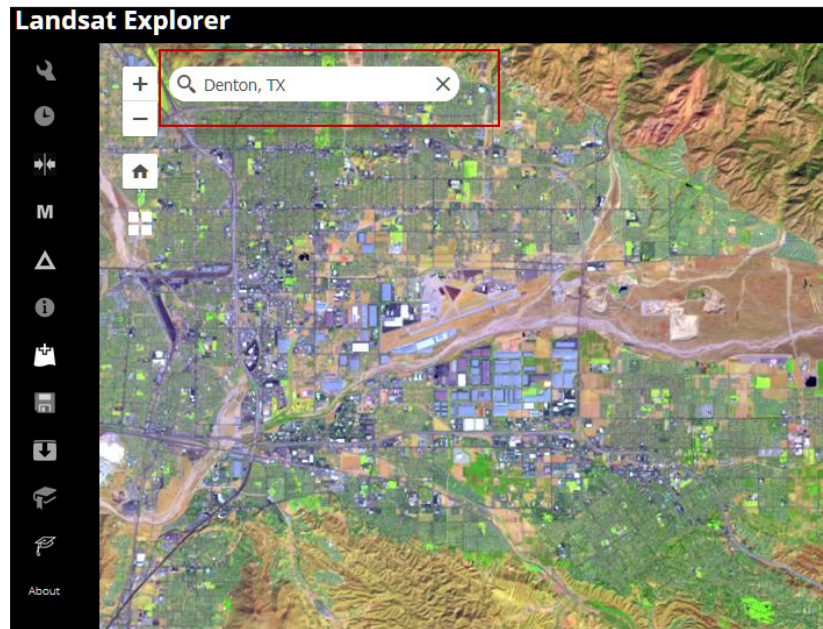
- ▶ Account not required
- ▶ Landsat Explorer app
- ▶ Estimated time: 30 minutes–1 hour

### Scenario

The Denton town council is still petitioning to stop fracking in their town. The council knows that more than 300 fracking wells exist within the city limits of Denton. Council members have asked your remote sensing company to prepare a time-enabled visualization of the number of wells introduced into Denton since 2001.

### Open Esri Landsat Explorer.

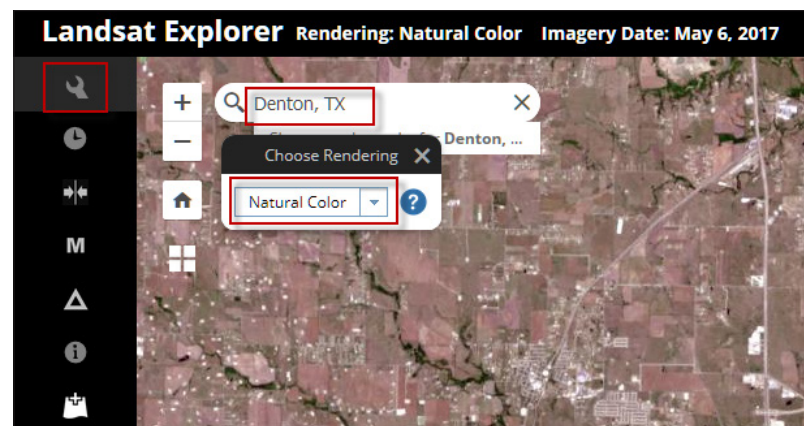
1. In the search box search for Denton, TX.
2. Select Denton, County, USA Denton County.



### Render natural color band combination and look at a basemap

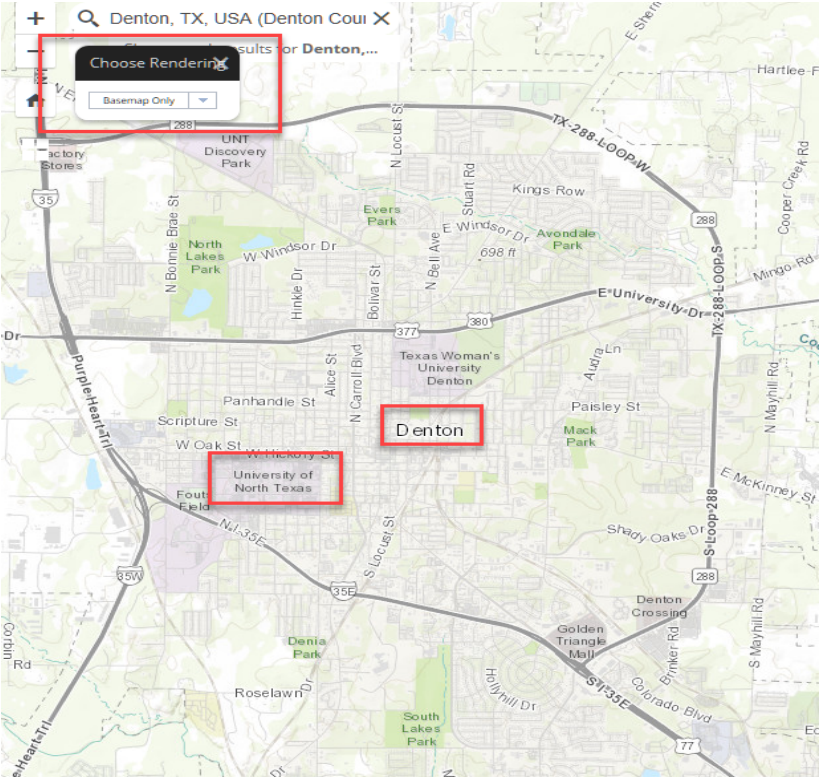
1. Go to the Renderer icon on the left panel and change the band combination to Natural Color.

This band combination approximates the spectral range of vision of the human eye. The natural color band combination has been pansharpened using the 15 m panchromatic band to achieve better imagery resolution.



2. Observe the urban area designated by the Search result.

- 3. Go to the Renderer and change to Basemap. Notice the area of the city limits of Denton.
- 4. Go to the Renderer and change back to Natural Color.



## Identify fracking wells and compare two images from different time periods

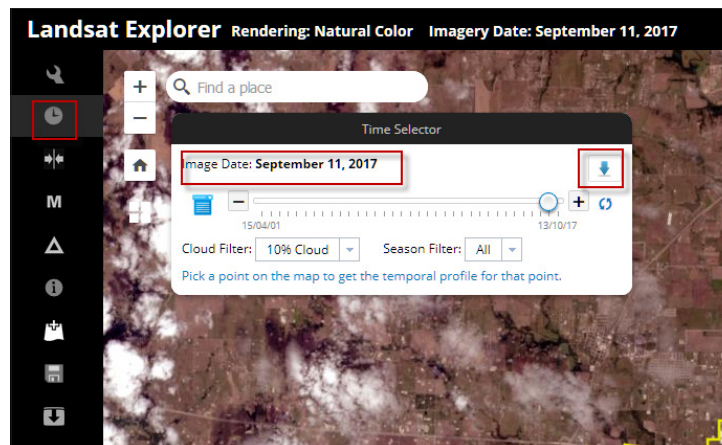
1. Zoom in to an area on the map and identify the white rectangles that are the fracking wells. There are numerous wells to the west of the city limit.



*What is the date of the image that is being viewed? Hint: Use the Identify Icon.*

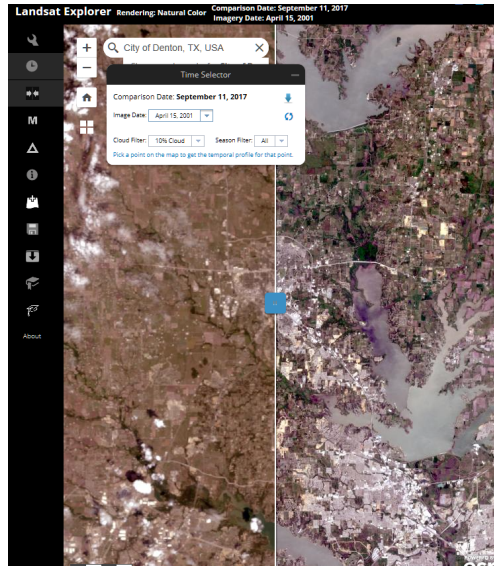
You are now ready to use the time selector to pick dates to visualize and compare.

2. Zoom back out so you can see beyond the city limits of Denton.
3. Pick the Time Selector on the left panel. Click the blue box to show the images in a drop-down list. Choose October 13, 2017.
4. Click the blue arrow pointing down to Set Current as Secondary Layer.





5. Click the Swipe icon on the left panel.
6. Use the time slider to select April 15, 2001, which is 16 years later than the first image.



7. Swipe back and forth between the two time periods. Move the image around to different locations.

*What do you observe about the quantity of fracking wells?*

*What area within Denton city limits appears to have added the most fracking wells?*

*What do you observe about the urban growth within the city limits of Denton?*

*Make a screen capture of the image and make three shapes around areas that have changed the most during the 16 year period.*

