

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 This referendum was rescinded when the state of Texas passes a bill that prohibited the banning of fracking. 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.

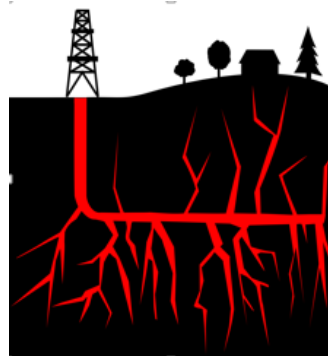
Council members have asked your remote sensing company to prepare a time-enabled visualization of the number of wells introduced into Denton since 2001.

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

What you need

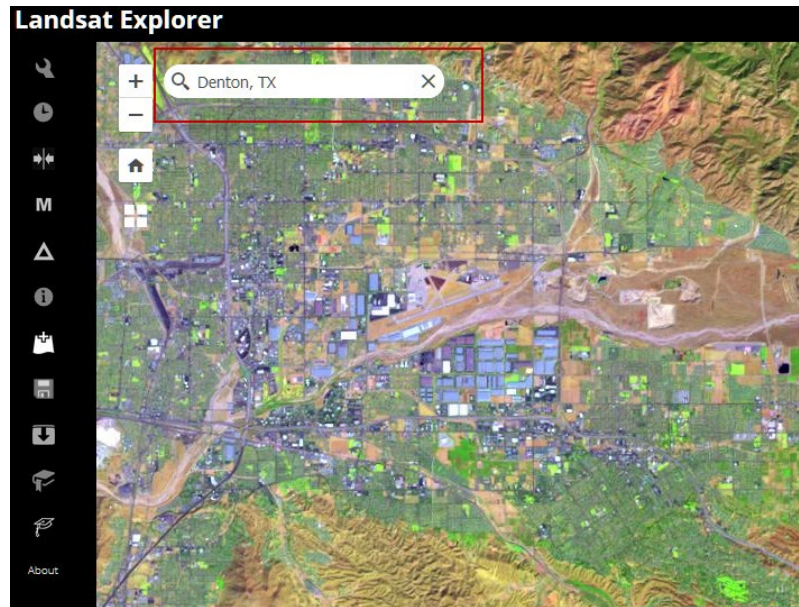
- Account required
- Landsat Explorer app
- Estimated time: 30 minutes – 1 hour



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1. Opening the Esri Landsat Explorer

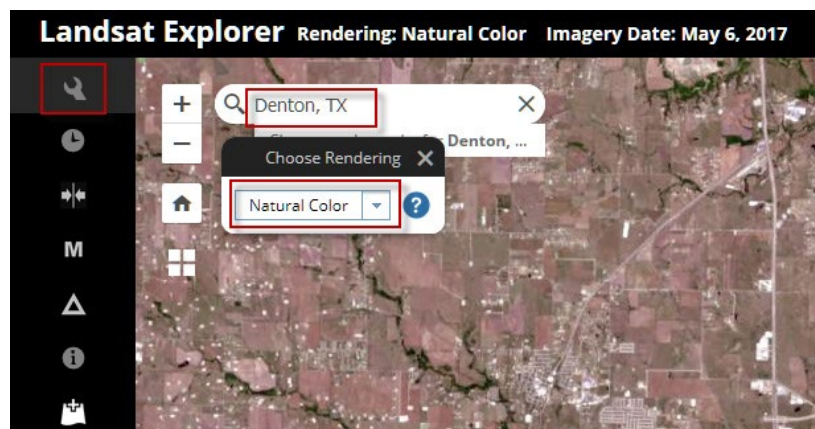
1. Open the [Esri Landsat Explorer](#).
2. In the upper right corner, sign into your organizational account.
3. In the search box search for Denton, TX.



2. Render natural color band combination and add Denton city limits

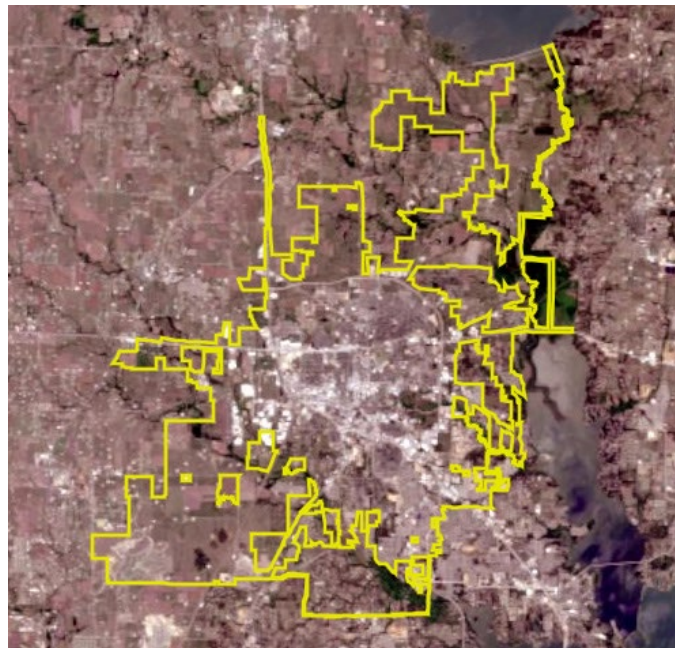
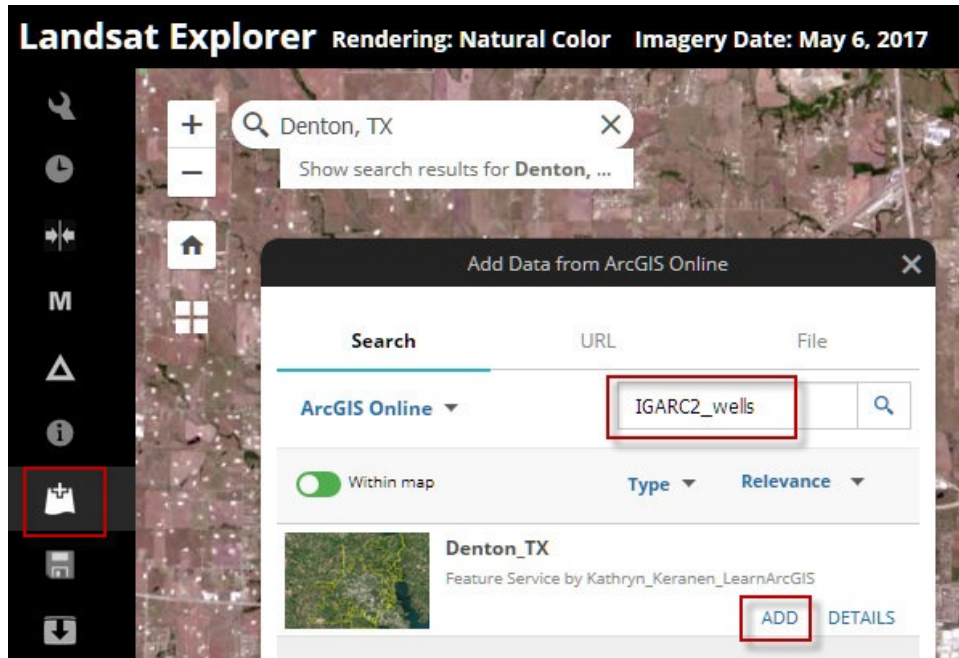
1. Go to the Rendered icon on the left panel and change the band combination to Natural Color.

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. Go to Add Data from ArcGIS online icon and search for Denton, TX.
3. Search in ArcGIS Online for IGARC2_wells.

IGARC2_wells are the Denton, TX, boundary that defines the city limits of Denton.



3. Identify fracking wells and compare two images from different time periods

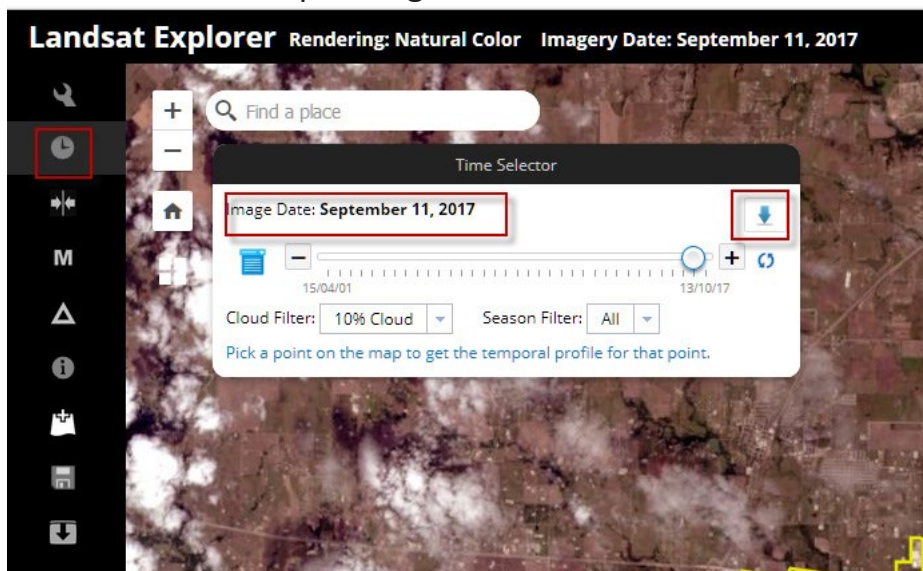
1. Zoom into an area on the map and identify the white rectangles that are the fracking wells.



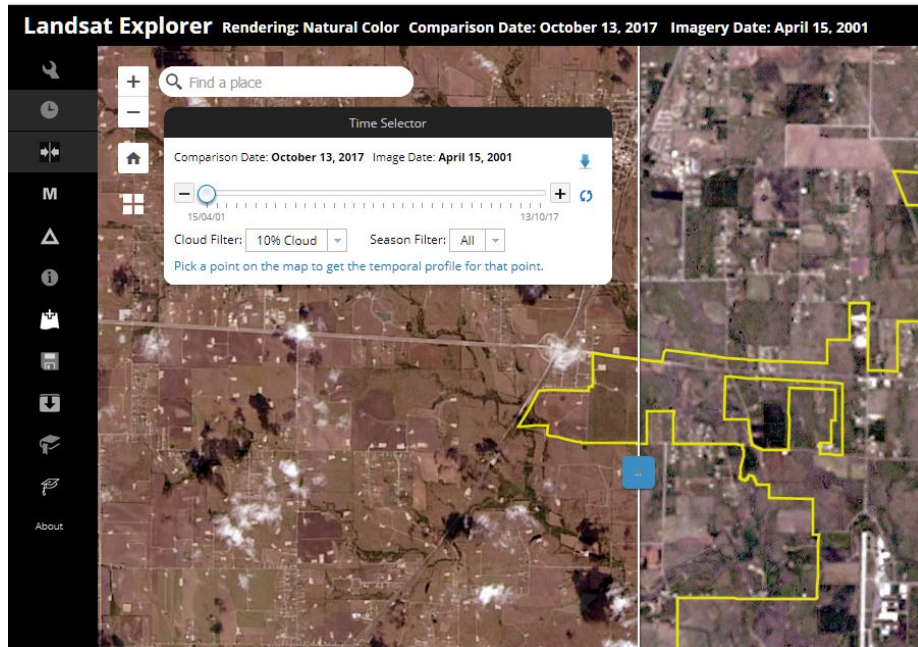
Q1 What is the date of the image that is being viewed? Hint: Use the Identify Icon.

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. On the slider, click the show dates drop-down list and choose September 11, 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 before the first image.



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

Q2 What do you observe about the quantity of fracking wells?

Q3 What area within Denton city limits appears to have added the most fracking wells?

