Visualizing La Tuna Canyon fire damage: One of Los Angeles's biggest wildfires in 2017

During the fall of 2017, a series of wildfires burned across California. During the early months of 2017, significant rainfall reduced the severe drought conditions of the state. This had led officials to believe that the fire season would be near normal. However, the rain had caused a spike in vegetation growth that dried out and increased fire activity. The La Tuna Canyon fire, which began in the foothills of Los Angeles, became one of the biggest wildfires in the history of the city. The fire burned more than 7,000 acres and forced the evacuation of many communities.

The Los Angeles Fire Department wants before and after images of the La Tuna Canyon fire to impress upon the citizenry the extent of the destruction. Fire officials have asked your GIS department to research and present a comparison.

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
- ➢ Computing the change between two dates
- ➢ Using a burn index to identify change

What you need

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

1. Open, search, and change band combinations using Esri Landsat Explorer App

1. Open Esri Landsat Explorer.
2. In the upper right corner, sign in to your organizational account.
3. In the search box, search for La Tuna Canyon.
4. Zoom into the La Tuna Canyon area.
5. Go to the Rendered icon on the left panel and change to basempa only.
6. Identify the following:
    a. Bob Hope International Airport
    b. Burbank
    c. La Tuna Canyon Road
    d. North Hollywood
7. 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. Compare two images before and after the fire

The La Tuna Canyon fire started on September 1, 2017, and the Los Angeles Fire Department declared that it was 100 percent contained on September 9, 2017. There are Landsat images available for the La Tuna Canyon area from August 28, 2017, which is before the fire started, and October 15, after it had been contained. You are now ready to use the time selector to pick dates to visualize and compare.

1. Pick the Time Selector on the left panel. On the slider, click the show dates drop-down list and choose October 15, 2017.
2. Click the blue arrow pointing down to Set Current as Secondary Layer.
3. Click the Swipe icon on the left panel.
4. Use the show dates drop-down list to select August 28, 2017, which is before the fire was started.

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

Q1 As you swipe back and forth, can you identify the burn scar?
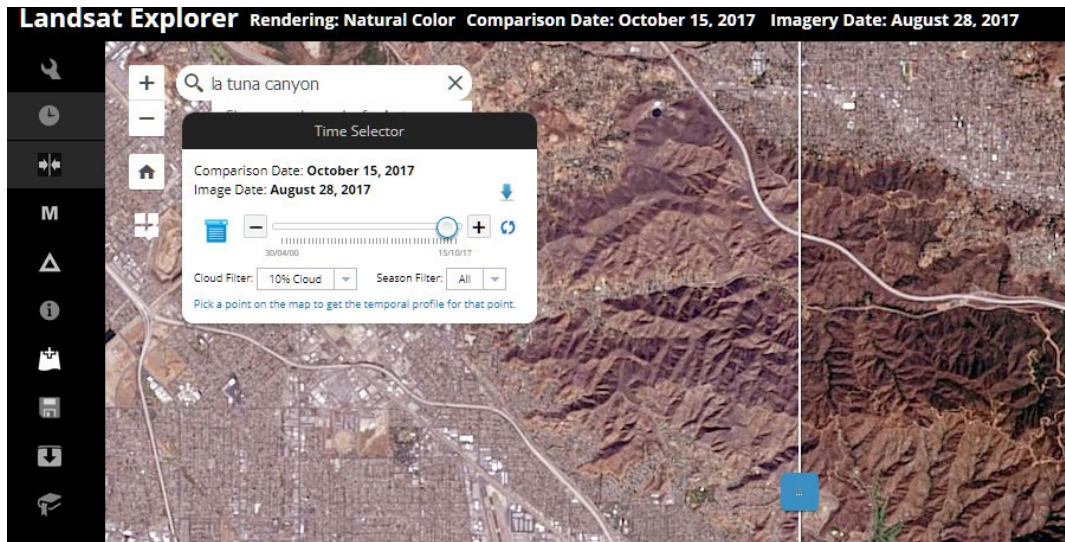
2. Change detection and Burn Index

The Change Detection tool can calculate changes in burned area.

1. Click the Change Detection icon on the left panel.
2. Change to Burn Index and Difference Mask.

The burn index uses band combinations to define areas that have burned and to index the severity.
The difference mask mode calculates the difference between the two images and when using the burn index, it is the burn/post-fire regrowth area. The change area defined is subject to the resolution to which the viewer is zoomed in to the image.

Q2 What is the burn/post-fire regrowth area?

3. Define area of interest

You can define an area of interest, which will make the measurement more accurate. The burn scar is so irregular that it will be more accurate if you just define a polygon and not try to digitize the area.

1. Click Define Areas of Interest on the Change Detection Menu.
2. Click a polygon around the area.
3. Double-click to end the area.
4. Click Apply and notice how the burn/post-fire growth area changes.

Q3 What is the burn/post-fire regrowth area?
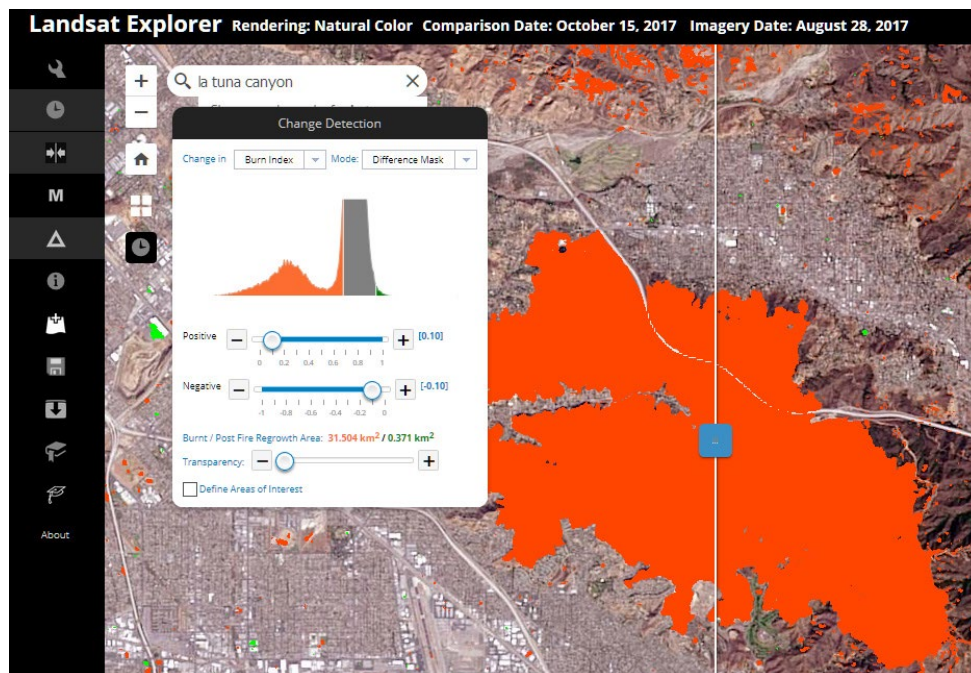
In this lesson, you have looked at data from two different time periods and compared them by a specific band combination called a burn index. Using the burn index, you have calculated the change in both the general image and a specific defined area.