

Lesson 7: Quantifying Land Changes over Time Using Landsat

Appendix 1

Phoenix Land Cover Key

To teachers and students: It will be tempting to use this land cover key without making your own class key. Avoid the temptation if time allows, because you'll learn more by creating your own key.

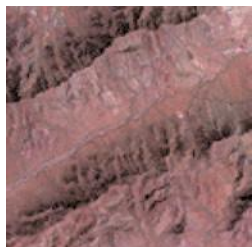
Here's a reminder about what the colors mean in the false color images provided for this activity (which are known as 7, 4, 2 images in Landsat terminology): These images show mid-infrared, near infrared, and visible green wavelengths.

Tones of red or pink in the 7, 4, 2 images represent the reflection of mid-infrared wavelengths from the Earth's surface. They comprise Band 7, which measures wavelengths of 2.08 to 2.35 micrometers (μm). (A micrometer is one millionth of a meter.) Mid-infrared wavelengths are useful for distinguishing between kinds of minerals and rocks, and for observing the moisture content of vegetation.

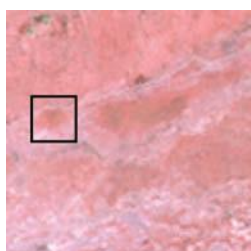
Tones of green in the 7, 4, 2 images represent near infrared wavelengths reflected from the Earth's surface. They comprise Band 4, which measures wavelengths of 0.76 to 0.9 μm . Near-infrared wavelengths are useful for observing soil moisture, distinguishing between kinds of vegetation, and seeing the boundaries of bodies of water.

Tones of blue in the 7, 4, 2 images represent visible green wavelengths reflected from the Earth's surface. They comprise Band 2, which measures wavelengths of 0.52 to 0.6 μm . Visible green wavelengths are useful for observing different kinds vegetation and for monitoring vegetation health, as well as for identifying human-made features such as roads, buildings, and parking lots.

Visual examples of Landsat imagery can be found on the next few pages.



Mountains. This is part of Phoenix South Mountain Park. The shadows cast by mountains can often help you to visually identify mountain features in Landsat images.



Non-vegetated or lightly vegetated terrain



Up close, the area in the black square above looks like the this.



This is some sort of shrub/brush (perhaps mesquite) with lots of bare ground between plants. This image is from Digital Globe's QuickBird satellite.



Agricultural Fields. The bright green areas are vegetated fields and the pink areas are unplanted fields. In Landsat images, agricultural fields can often be recognized by their rectilinear appearance.



Urban, densely developed terrain.



Up close, the area in the black square looks like the image below:



This image is from Digital Globe's QuickBird satellite. It shows a densely built neighborhood with a park at



Densely populated residential urban area with three golf courses. Phoenix is known for its many golf courses. The bright green of the Fairways, teeing grounds, and putting greens help you identify golf courses on Landsat images. Can you find other golf courses in the large Phoenix images? Are there new golf courses on the 2001 image?



This is an example of a golf course under development

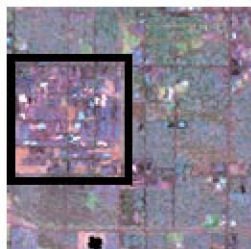


Today up close, the golf course looks like this:



This image is from Digital Globe's QuickBird satellite.





Mixed use urban area, densely situated buildings.



Up close, the area in the black square looks like an area of large buildings, most likely warehouses.



Image above is from Digital Globe's QuickBird satellite.