

Isn't That Spatial

Teaching Historical Geography and Landscape Change Using Historical Aerial Photographs and Topographic Maps, Part 2

In my last column, I discussed ways in which historical topographic maps can enhance the teaching of historical geography and landscape change. In this column, I illustrate how historical aerial photographs can enhance geography education and provide resources where these historical aerial photographs may be obtained.

Attempts to photograph the surface of the Earth date from the 1800s, when photographers attached cameras to balloons, kites, and even pigeons. Today, aerial photographs and satellite images are commonplace, particularly with the advent of remote sensing and geographic information systems. Views of the Earth obtained from aircraft and satellites have become valuable tools to resource planners and managers, land-use experts, environmentalists, engineers, scientists, and a wide variety of other users, including educators.

Aerial photographs, as I and others have discussed in previous articles in the *Perspective* and in the *Journal of Geography*, may be the single richest resource for geography education. They provide an incredible amount of detail—some at 1 meter or even at 1 foot resolution—for students to examine everything from the land use patterns in their own community to urbanization, afforestation, deforestation, river deltaic processes, glacial retreat, and other processes around the country and around the world.

Why do some areas change rapidly, while others are changing very little? How do physical forces such as volcanoes and river meanders change the landscape compared to human-caused alterations such as the construction of reservoirs, highways, levees, and housing developments? As an example of the use of aerial photographs, consider these three aerial photographs of an elementary school and its surrounding neighborhood in Colorado.



The 1995 aerial photograph above shows the school as two distinct circular buildings, with trees along its south side, and a playground to the northeast. What is the predominant land use in the area—commercial, residential, industrial, agriculture, or something else? At what time of year and what time of day was the aerial photograph taken? Here, the shadows indicate that the photograph was taken in the morning; the lack of leaves but not too lengthy a shadow indicate that the season is early spring.



By 1999, construction had begun on the school, evident in the disturbed surface that had a high reflectivity. The presence of vehicles in the parking lot indicate that this photograph, unlike the 1995 photograph, was captured on a school day. The presence of leaves and the shadow indicate an early autumn or late summer afternoon.



By 2002, construction was evidently complete. The trees around the old parking lot had been removed to relocate the lot, and new trees planted. Notice how one of the former circular buildings had been retained in the new school. Despite the new construction, three temporary buildings were already parked on the grounds. School is obviously in session during this spring morning. Notice that this aerial photograph was captured in a higher resolution than the other two, resulting in the ability to detect smaller objects on a sharper image.

Sources of Aerial Photographs

One of the richest sources for USGS aerial photographs in the USA is Terraserver (terraserver-usa.com). In many areas, 1990s vintage and 2002 aerials are available. The National Map (nationalmap.gov) also contains aerial photographs, roads, rivers, land cover data, and much more. To obtain a custom digital file of any older historical or current aerial photograph for any area in the USA, call 1-888-ASK USGS. The USGS information sheet entitled "Looking for an old aerial photograph" on mac.usgs.gov/isb/pubs/factsheets/fs12796.html provides information on how to obtain aerials from the USGS, from the National Archives, and from the Library of Congress.

Many state governmental portals offer historical aerials, such as Illinois' 1938-1941 database from the Illinois State Geological Survey on

meltwater.isgs.uiuc.edu/website/ilhap/viewer.htm, the Louisiana Digital Library on louisdl.louislibraries.org/LSAP/Pages/home.html, the University of Colorado Library's 1930s through 1970s aerial project on ucblibraries.colorado.edu/aerialphotos/about.asp, and the 1948 aerials on the California State GIS site, gis.ca.gov. Most of these sites offer new aerials as well, so students can compare how the physical and cultural landscape changes over time.

Many local governments offer historical aerials, such as King County, Washington, which features historical aerials viewable with a sliding toolbar, allowing the user to view selected portions of photographs of different ages on dnr.metrokc.gov/topics/map/aerials/Compare.htm.

For countries outside the USA, national mapping agencies and private companies produce aerial photographs. For example, in the UK, the Ordnance Survey (www.ordnancesurvey.co.uk) is responsible for mapping and aerial photography, and WildGoose (www.wgoose.co.uk) is one private company that produces aerial photography. Many web services such as multimap.co.uk offer aerial photographs in addition to their maps.

Finally, a new excellent resource to use with aerial photographs is Paul Baumann's new NCGE Pathways publication, *Up Close From Afar—Using Remote Sensing to Teach the American Landscape*.

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