Historical Air Photo Interpretation

Author: Ecology Explorers Education Team
Time: 50 minute
Grade Level: 6-12

Background:
Aerial photographs are one way to look at change over time. In the metropolitan Phoenix area, much of the urban growth has taken place in the past 50 years, so it is possible to find photographs from the same location and see dramatic changes. This activity will encourage your students to think about patterns of development in the changing urban landscape.

Objectives:
The student will be able to:
• identify and analyze land use changes over time with historic aerial photographs.
• learn to classify different land use into categories

Advanced Preparation:
Students should be able to read aerial photographs and identify land-use categories

Materials:
Aerial photographs from the several locations taken over time (you can do this activity with just one location, but it is more interesting looking at several locations).
You can find maps at: http://ecologyexplorers.asu.edu/get-started/slide-sets/ Click on Historical Aerial Photos.

Suggested Procedure:
1. Hand out historical aerial photographs to each group of students. Allow the teams to become familiar with the photographs. Use the attached land-use categories to classify the area, or create your own land-use classification.
2. Have the students identify land uses in each of the photographs and discuss changes. See student handout for questions.
3. Facilitate a discussion about past, present and future trends. Discuss differences among the historical photographs. Are there differences in land-use changes in areas that were agriculture vs desert? How have the changes affected the lifestyles of people living in the areas?

Evaluation:
• Observation during the activity and participation in discussion.
• Student responses to reflection questions.

Extensions:
• Calculate the changes in land-use types over time.
• Study local historical documents to understand changes in land use
• Interview long-time residents or a local historian about these changes
• Identify social and political impacts of these changes on the community and the environment

References:
AZ Standards

Science
Science Personal & Social
S3-C2-GR7-PO1
S3-C2-GR7-PO2
S3-C3-GRHS-PO1
S3-C3-GRHS-PO2

Social Science
American History
SS1-C1-GR6-8-PO4
SS1-C1-GR7-PO8
SS1-C1-GR8-PO8
SS1-C1-GRHS-PO6
SS1-C2-GR7-PO4
SS1-C2-GR8-PO5
Geography
SS4-C4-GR7-PO1
SS4-C4-GR6-PO3
SS4-C4-GRHS-PO5
SS4-C5-GR7-PO3
SS4-C5-GR7-PO5
SS4-C5-GRHS-PO4
SS4-C6-GR6-PO2
Land-Use Categories (adapted from CAP LTER, MAG, and Explorations from an Aerial Perspective)

Residential
Single-family home: small rectangular buildings with driveways aligned to street
Single-family home large lot: small rectangular buildings on large lots (less housing density than single family homes)
Multi-family (apartments/townhomes): multi-storied buildings, off street parking

Commercial/Industrial
Businesses: rectangular buildings, larger than houses, grouped along major streets
Shopping Malls: large, flat-roofed buildings, large parking areas
Manufacturing: large flat-roofed buildings with loading docks, possibly with loading docks, piles of raw materials or smokestacks
Mining: most commonly gravel pits associated with waterways

Open Space
Golf Courses: presence of sand traps, grass, small ponds
Neighborhood Parks: vegetated areas, lawns, ball fields, playground, tennis courts
Vacant: surrounded by development
Desert Parks/Land: desert vegetation, washes, different elevations

Public
Schools: large rectangular buildings, adjacent to fields, athletic track
Church: rectangular building, parking lots, along major streets, may see steeple

Water
Canals: linear water ways
Lakes/Ponds: small bodies of water (lakes in residential developments/parks)
Reservoirs: large bodies of water (Tempe Town Lake)

Agriculture
Cropland/Pasture: rectangular fields, machinery, fences
Orchards: rectangular fields with trees

Transportation
Highway: limited access multi-lane roads
Major Road: multi-lane roads, typically lined with businesses, churches, shopping centers
City Streets: two-lane, dense rectilinear grid pattern with residential development
Railroads: linear, passenger and freight lines
Look at the various photographs given to you by your teachers. These aerial photographs were taken at the same location over the past 30 years.

Record the land uses for each year. Include under comments any information you think might be important when looking at the changes.

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Questions:

1. What were the major changes you observed in your photographs?
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2. Compare your observations with those of your classmates. Did all of you see the same changes?
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   What was the same?
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   What was different?
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Is there a difference in land-use over time in areas that were formerly desert vs. areas that were formerly agricultural lands?
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3. What do you think will happen to this area in the next 10, 20, 30 years?
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4. How have the lives changed of people who lived in this area in 1970 as compared to today? What things would be better? What things would be worse?
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5. Describe how changing land-use over time may have impacted animal life.
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6. Describe how changing land-use over time may have impacted farming and water supply.
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