

Kite Aerial Photography

Objective: Introduce kite aerial photography and its potential as a remote sensing tool.

The first kite aerial photograph was taken in 1888 by Frenchmen Arthur Batut. He attached a camera to a kite and proceeded to fly it. This original picture has survived and can be viewed. It was a picture of the French countryside near Batut's house. The original kite frame is currently on display in a museum in France. Interest in kite aerial photography (KAP) is currently on the rise. This has been attributed to better equipment and quality of photographs taken.

KAP is a form of aerial photography that is relatively inexpensive compared to other forms of aerial photography. New uses and ideas for this form of aerial photography are rapidly developing. KAP is a versatile way to gather aerial photographs of an area. KAP is considered a form of remote sensing. Aerial photographers allow us to look at physical and biological aspects of the environment.

The basic components needed to create a kite capable of aerial photography include a kite(s), line, reel (spool), camera (digital or film), and a cradle. Kites used for this are usually of the delta or airfoil style. The size of the kite determines what wind speed it should be flown in. Larger kites should be used in light winds, while smaller kites are used in stronger winds. The line should be a heavyweight and able to handle the weight of the camera and kite. It is also important to have plenty of line when flying the kite. The reel needs to be large enough to hold the all the line. The camera needs to meet weight requirements as well as have infra red capabilities.

There are three main risks or hazards in conducting KAP. They are risk to KAP equipment, property and to people. The equipment risk is due to getting caught in trees and rough landings on concrete or water. Property damage can occur when a kite rig gets caught or crashes into a building. When flying a kite, power lines are a major hazard to people. It is also important for the kite flyer to pay attention to their surroundings if moving with the kite. If the kite is being flown in a crowded area, it is best to scout the area first and determine emergency landing sites.

Uses of KAP have included property and cemetery surveys, crop scouting, and golf course management. Research studies have used KAP to study forest canopy and cover, penguin behavior in Antarctica, fossil forest beds in Canada, archeological and geologic mapping of Dutch explorer William Barents wintering site, stream channel characteristics in Kansas, and wetland observations. It has also been used in architectural design for planned construction areas, erosion mapping, and looking at landforms caused by glacier movement.

It is used in scientific research because it is a cheap, stable platform to take pictures from. It can be used almost anywhere, especially in remote regions without disrupting the natural environment. Another advantage is it can be flown at many different heights easily. It can be quickly deployed and allows for repeatability of pictures. There is minimal training required for users of KAP.

For more information:

<http://scotthaefner.com/kap/>

<http://www.geospectra.net/kite/kaphome.htm>

www.IntotheWind.com

ACTIVITY

- A.** Look at the photos included with this lesson. They were all taken on the same day and location. What do you notice in these photos? Compare and contrast them. How could these be used by a farmer? What surprises you about the photos?
- B.** Flying the OSU 4-H Kite Aerial Photography Rig:
1. Get the servo rig set up and attach the camera to it.
 2. For safety, put on the gloves to protect your hands from the line.
 3. Get the kite(s) out of the bag and attach the line and tail to them.
 4. Let the kite(s) go up. If flying both kites, determine which one is steadier. If there is only one kite, make sure the wind conditions are ideal to fly the kite.
 5. Bring the kite down some and attach the camera rig to the line, making sure everything is turned on and properly attached.
 6. Let the line go out! Be careful that the spool of line does not let line out too quickly. Remember to be aware of your surroundings.
 7. When bringing the kite down, use something to help reduce the tension on the line.
 8. Once the camera rig is reachable, take it off the line and turn all equipment off.
 9. Detach the kite from the line and fold it up.
 10. Pack everything away neatly; making sure nothing is left behind.
 11. Take the camera and load the pictures onto a computer to view your pictures.
 12. Discuss what you see and what you do not see.
- C.** If computers are available, look to see what type of research has been done with KAP. A good start is to look up James Aber. There are also a lot of great photographs from KAP'ers online too.

HELPFUL HINTS with KAP

A way to determine how much of the landscape is in a picture is to lay an object such as a ceiling tile or a large piece of wood in the area you are working in. The GPS coordinates of this object can be taken. By having this object(s) in the pictures, it allows an overlay of pictures. The potential of geocoding of the picture is also possible.

Helpful hints to KAP'ing include using the recommended line for the kite and the camera rig. When bringing the kite down, reel in the line to minimize the knotting. Walk the line down by using a pulley or something similar to minimize the tension buildup on the line. Select a reel or spool that is appropriate. Make a mark on the line every 100 feet so you know how far the kite is out. It is important to remember not to fly kites near power lines, airports, trees, and other overhead hazards. Check the wind speed before beginning to determine if the conditions are appropriate and the size of kite to use.

Things to remember include that the wind is usually the most turbulent closest to the ground. Let the kite out some, and then attach the camera to the line. Before letting line out, it is important to check that the camera and servo are both on and working. When you bring the camera rig down, do not forget to turn the equipment off.