**Table 4**

**Remote Sensors for Monitoring Applications**

| Sensor | Features |
|---|---|
| Photography | fine spatial resolution daytime, clear skies, film requires processing |
| Thermal infrared | fair spatial resolution night or day, clear skies, can provide real-time data |
| Radar | coarse spatial resolution night or day, all weather, can provide real-time data |

A 70-mm format reconnaissance camera can be used in these cases. It is relatively inexpensive, rugged, reliable and easy to use, requiring a minimum of maintenance. Some cameras are specifically designed to acquire hand-held oblique aerial photographs. These cameras typically use 70-mm film to provide a film format large enough for serious interpretive tasks. They can take high quality oblique photographs from ranges of up to several kilometres.

Thermal infrared sensors are another type of aerial imaging system. Thermal infrared systems produce images by sensing the thermal energy that is emitted by all surfaces according to their temperature. They can be used at night as well as during the day. They are better than photographic systems for penetrating haze and smog. However, thermal infrared radiation cannot penetrate cloud cover, so thermal systems are most effective when used under clear sky conditions.[10] Aerial thermal infrared reconnaissance can be done using thermal infrared linescanners or forward-looking infrared (FLIR) systems. The two kinds of sensors are intended for different missions. Table 5 contrasts selection criteria for the two sensor systems.

FLIRs produce real-time thermal imagery in a framed format, similar to that of a video camera. They are usually used to view a scene or specific targets obliquely. Systems designed for reconnaissance missions have a sensor head mounted beneath the aircraft, which can be pointed toward points of interest by an operator inside the aircraft using a video display and a set of controls. Most FLIR systems have several fields of view (FOVs). A good FLIR will provide very high spatial resolution in its narrowest FOV.

Infrared linescanners (IRLSs) use a rotating mirror and optics to direct thermal energy from a small ground surface area to a detector or array of detectors. The mirror rotates perpendicularly to the line of flight. With each cycle of the mirror, a strip of ground normal to the flight direction is sensed. The forward motion of the aircraft causes successive scan lines to cover adjacent strips on the ground, making a two-dimensional image (Figure 4). The data may be displayed in near-real time on a display screen or dry silver paper during the overflight.