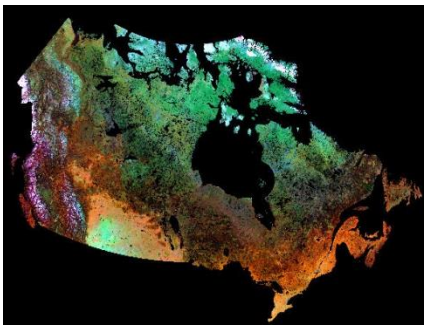
## About Remote Sensing

Remote sensing is the measurement or acquisition of information from an object by a recording device that is not in contact with the object. An aircraft taking photographs, Earth observation and weather satellites, medical x-rays for bone fractures and the monitoring of a pregnancy via ultrasound are all examples of remote sensing.

In forestry, the term 'remote sensing' generally refers to techniques involving the use of instruments aboard an aircraft or spacecraft for measuring forest land characteristics.



**Active and Passive Sensors**

Remote sensing devices make use of emitted or reflected electromagnetic radiation from the object of interest in a certain frequency domain (infrared, visible light, microwaves) since the objects under investigation reflect or emit radiation in different wavelengths and in different intensities according to their current condition. Remote sensors are classified as either active sensors or passive sensors. Active sensors provide their own source of radiation to send out to an object and record the magnitude of radiation returned. For example, a radar system sends out a beam with a known wavelength and frequency. This beam hits the target and is reflected back to the sensor, which records both the intensity and time it takes for the beam to return to the sensor.

Passive sensors on the other hand, record incoming radiation that has been scattered, absorbed and transmitted from the Earth in transit from its original source, the Sun. A camera, represents a passive system since it records light entering the aperture. Essentially, active sensors provide their own source of radiation while passive sensors record radiation coming from external sources.

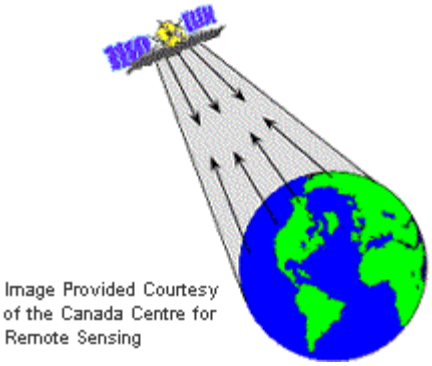


Image Provided Courtesy of the Canada Centre for Remote Sensing

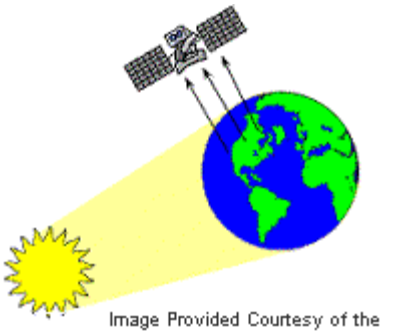
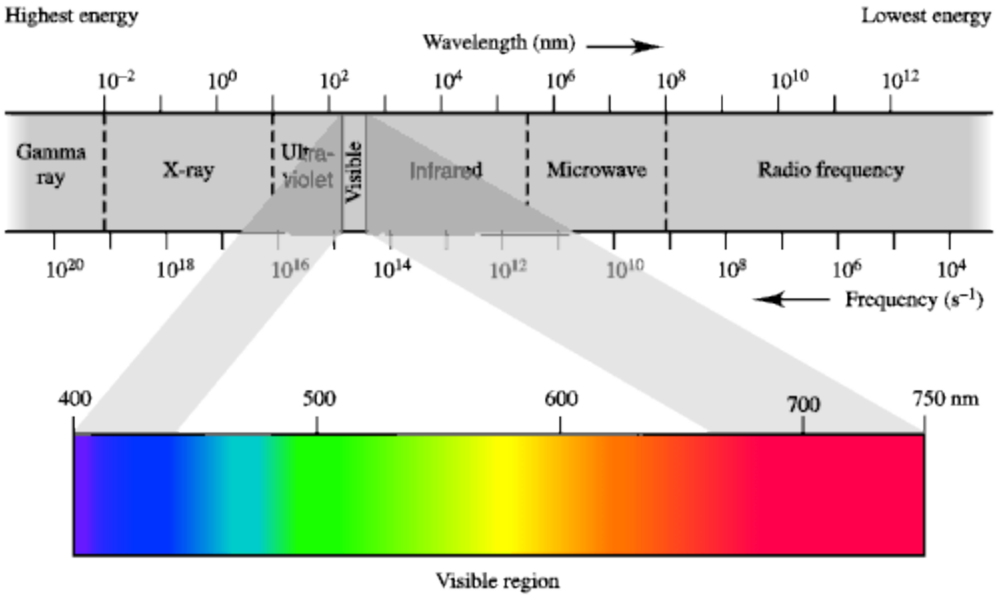


Image Provided Courtesy of the Canada Centre for Remote Sensing

**Spectral, Spatial and Temporal Resolution**

The term resolution (or resolving power) represents a measure of a sensor's power to resolve features in the spectral, spatial and temporal domains. Spectral resolution therefore represents the power to resolve features in the electromagnetic spectrum. For example, a SW imaging system records data across hundreds of spectral wavelengths in very small increments often in 5-10nm – analogous to the spectral resolution of the sensor.



The spatial resolution of a sensor deals with how well features can be resolved in space and is indicative of the detail contained within a remotely sensed image. The figure below shows the difference in detail between a scanned air photo with a ground pixel size of 0.5m and a Landsat image with a ground pixel size of 30m.

**Satellites - Missions, Sensors and Platforms**

- ASTER
- AVHRR
- ENVISAT
- IKONOS
- IRS
- JERS
- LANDSAT
- MODIS
- MODIS
- ORBVIEW
- QuickBird
- RADARSAT
- SPOT