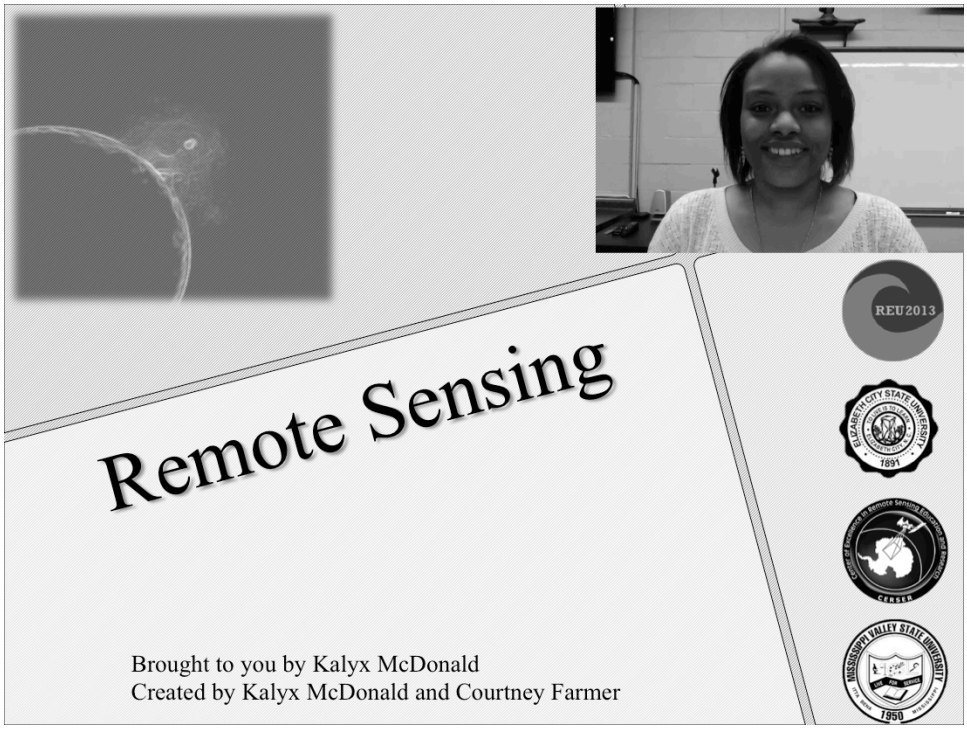

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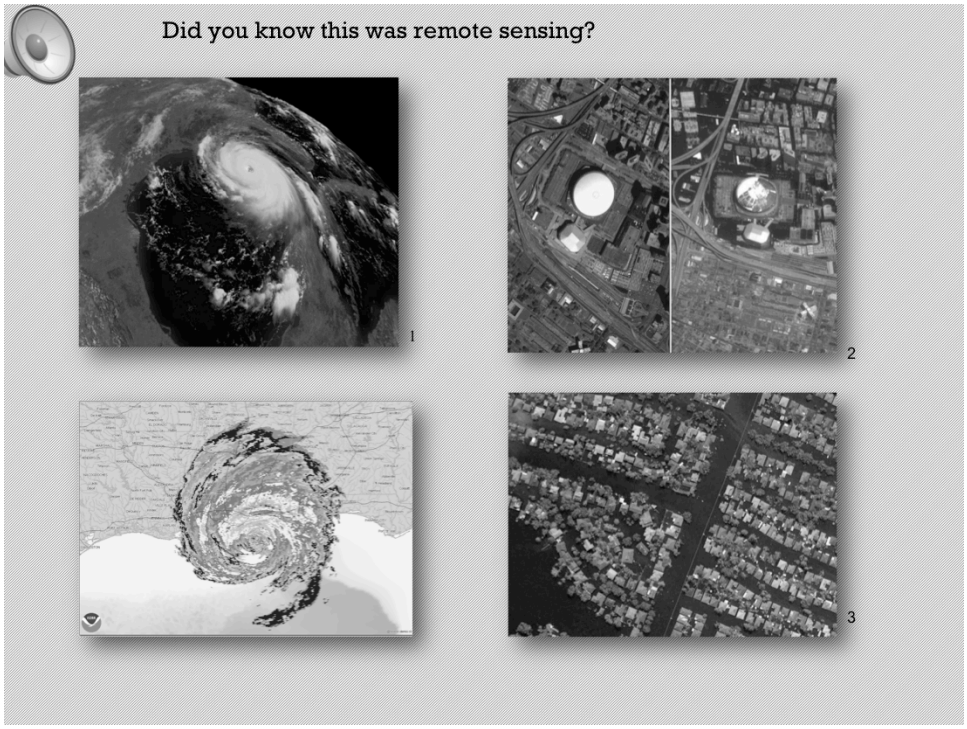
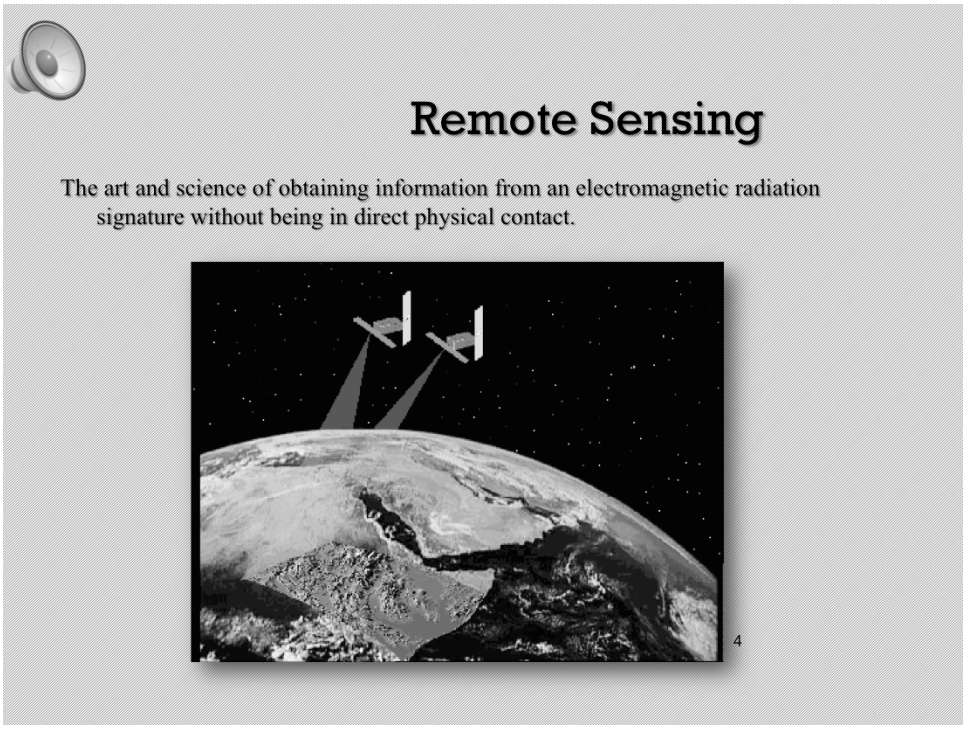


In 2005 a tropical storm turned into a category 5 hurricane known as hurricane katrina. The images you see are pictures of New Orleans from a satellite and aircraft. This natural disaster killing about 1400 people is an event no one will forget. With the use of remote sensing technology and sensors,we can detect and prevent future events to come.



So now that you've seen an example, what exactly is remote sensing?

It's when you obtain information from an electromagnetic radiation signature without actually being there.

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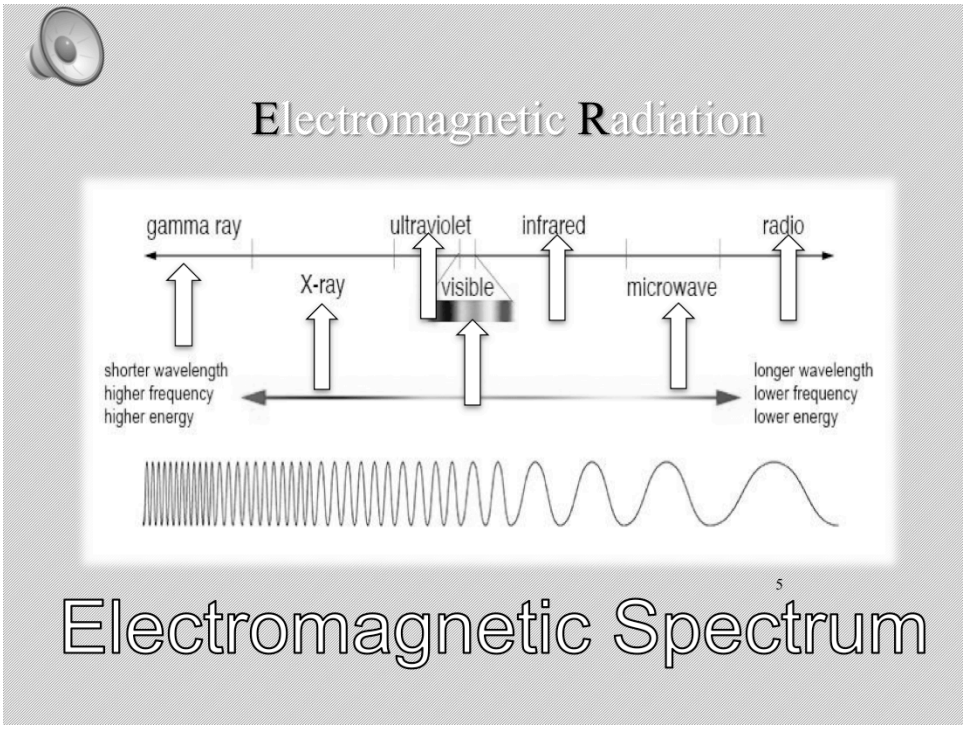


electromagnetic radiation ranges 7 possible frequencies on the electromagnetic spectrum.

The first being gamma ray which has faster & shorter wavelengths, to radio waves which are large but have a lower frequency.

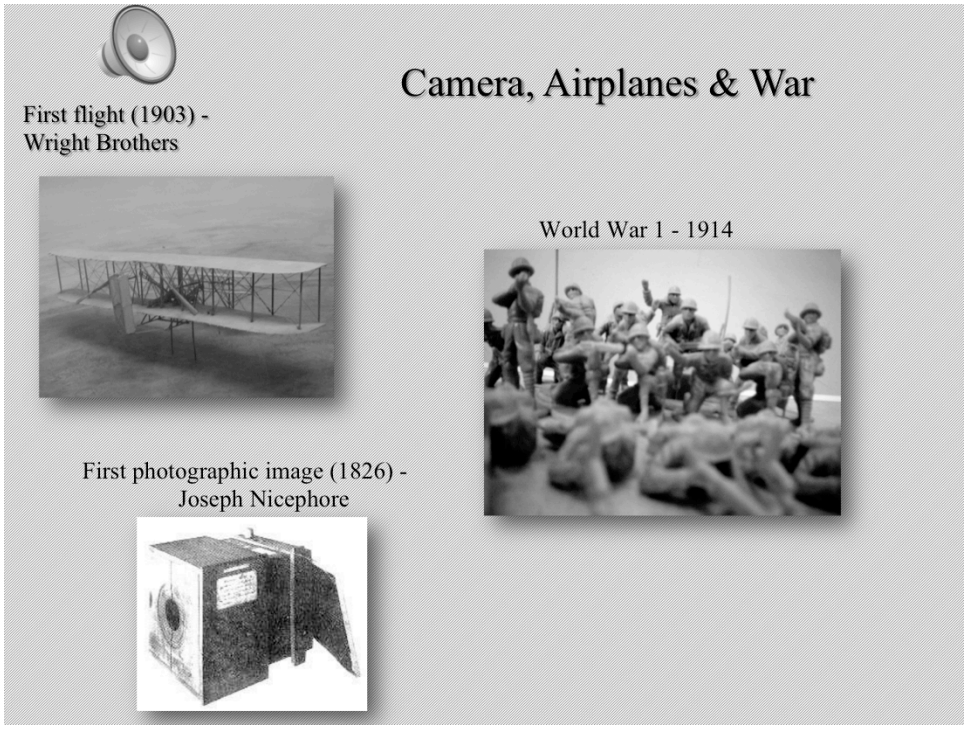
Gamma Rays have greater energy and are produced by violent events like supernova explosions.

X-rays Can be hot gases in the universe but are mainly used in hospitals.

next is Ultraviolet. the earth's ozone layer absorbs most of the incoming ultraviolet light from the sun. if not it could be very harmful to us.

visible is the only radiation detected by human eyesight.

Infrared is emitted by any object that has a temperature and can be divided into 3 parts. far,mid and near. that means some infrared



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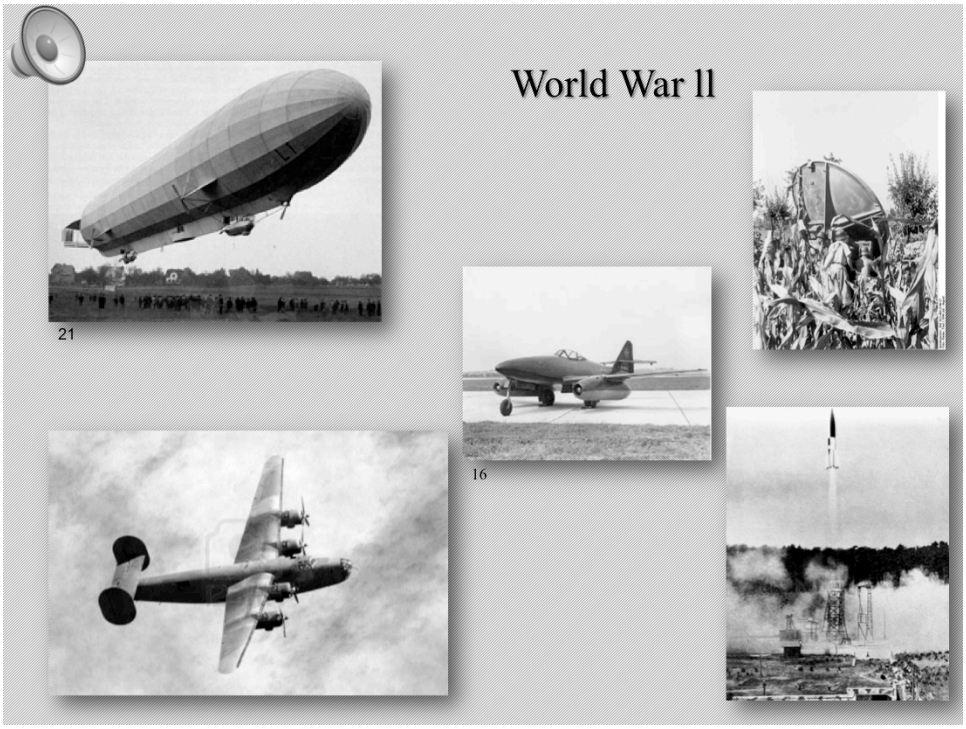
As paraphrased by Kofi Annan, Knowledge is power and Information is liberating .
The first camera was invented in 1826 while the first flight in 1903. together, in WW1 these 2 technologies were the beginning of remote sensing. They were used to locate troops along with enemy grounds.



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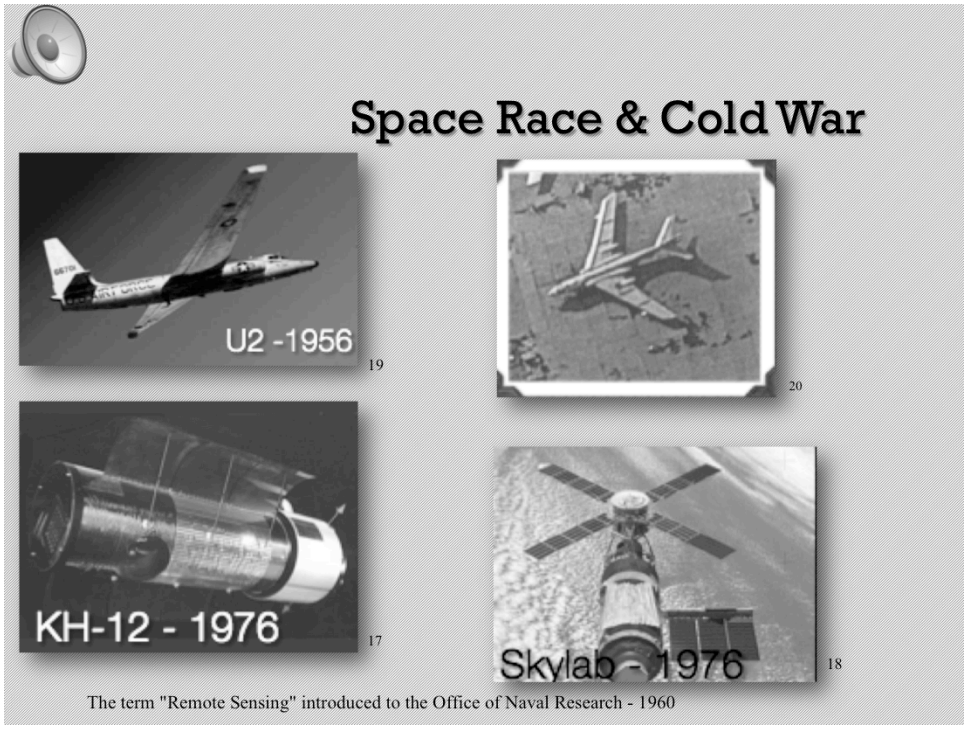
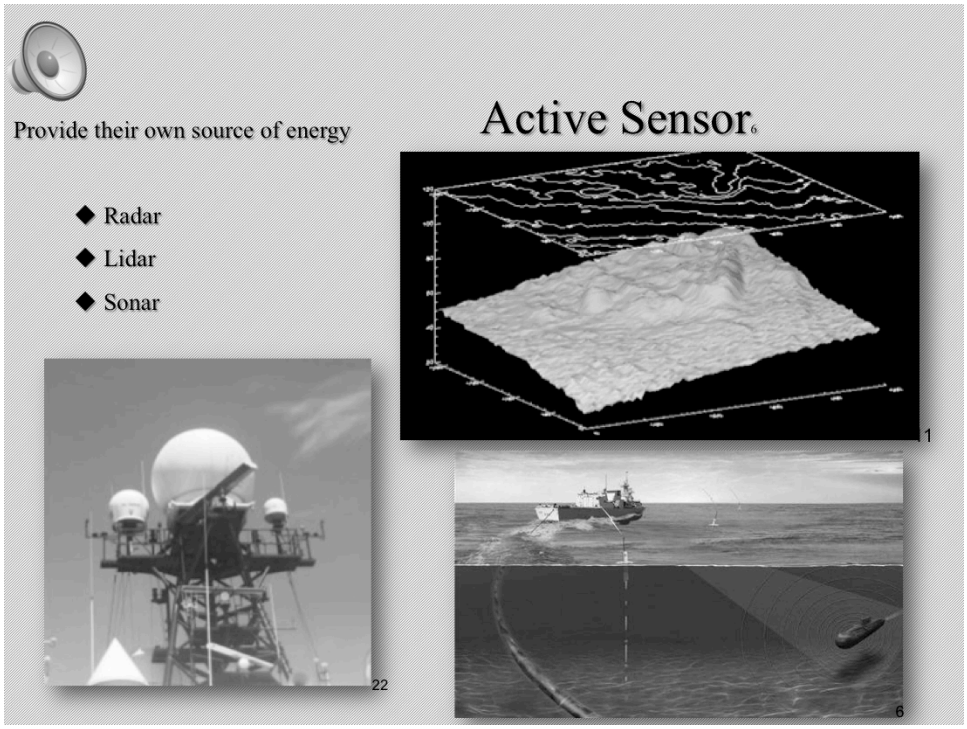
During WW2, both sensors and platform technology improved. Platforms such as the zeppelin, v2 rocket and the M.E 262 jet allowed
increased range, payload and speed of aircraft. Sensing technology improved in both image resolution and a new sensor type called the radar.
An early radar system first detected the raid on pear harbor in hawaii. However, the report was ignored because it was an unproven technology.



Platform technologies included the U2 spy plane, KH-12 satellite and skylab. During this time in 1960 the term remote sensing was introduced by the office of navel research.



Remote sensors fall into 2 categories. Active and passive. Active sensors provide their own source of illumination. Examples are the radar which is used for speed detection, lidar for ground detection and sonar to find ships and submarines.

Passive sensors measure naturally available energy and Need an external energy source
the human eye will forever be a passive sensor as we observe more than over a thousand things per day and have different reactions.
Other examples include the camera and microwave radiometer

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In a sensor, there is more than just what you see. resolutions are often utilized for image interpretation. the 4 types are spatial, spectral, temporal & radiometric.

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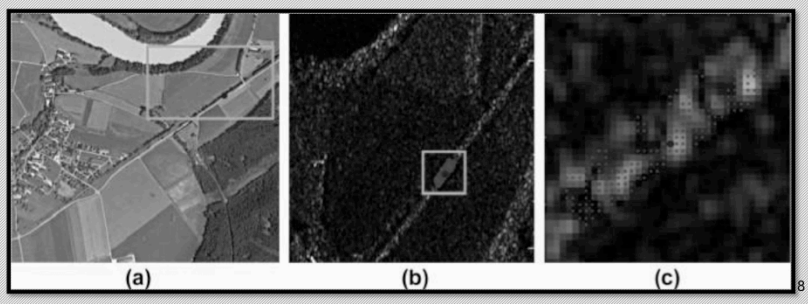
1. The size of a pixel that is recorded in a raster image
2.The wavelength width of the different frequency bands recorded – usually, this is related to the number of frequency bands recorded by the platform.
3. The frequency of flyovers by the satellite or plane, and is only relevant in time-series studies or those requiring an averaged or mosaic image as in deforestation monitoring
4. The number of different intensities of radiation the sensor is able to distinguish.

Spatial Resolution[7]

It describes the ability of any image forming device such as an optical or radio telescope, microscope, or camera to distinguish small details of an object thereby making it a major determinant of image resolution

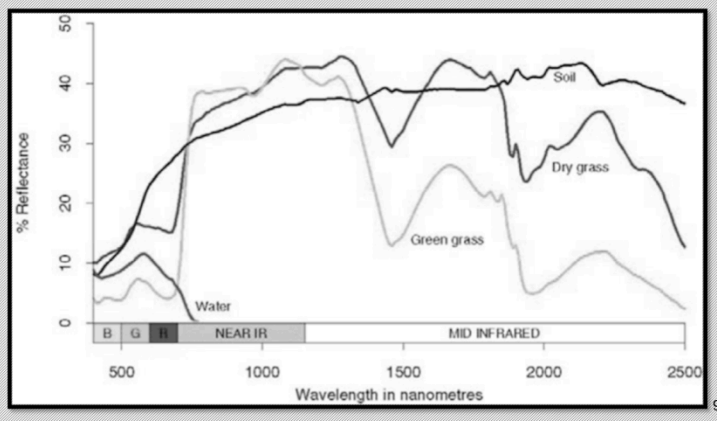


[8]

This means that as the visual gets closer various pixels are made up to distinguish a image.

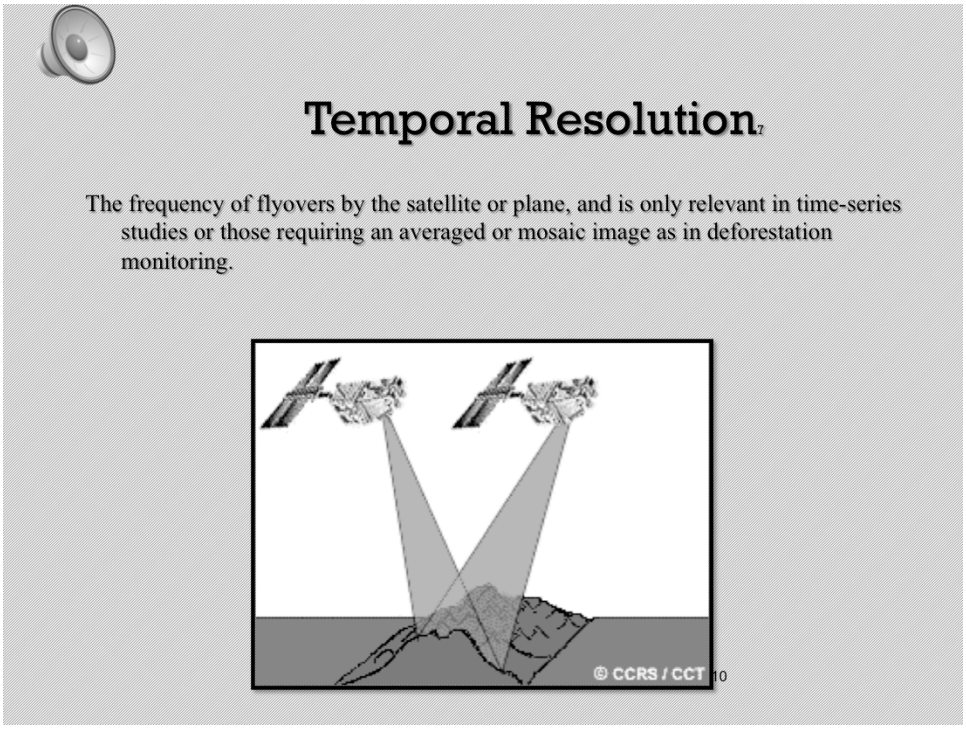
Spectral Resolution

The measure of its ability to resolve features in the electromagnetic spectrum

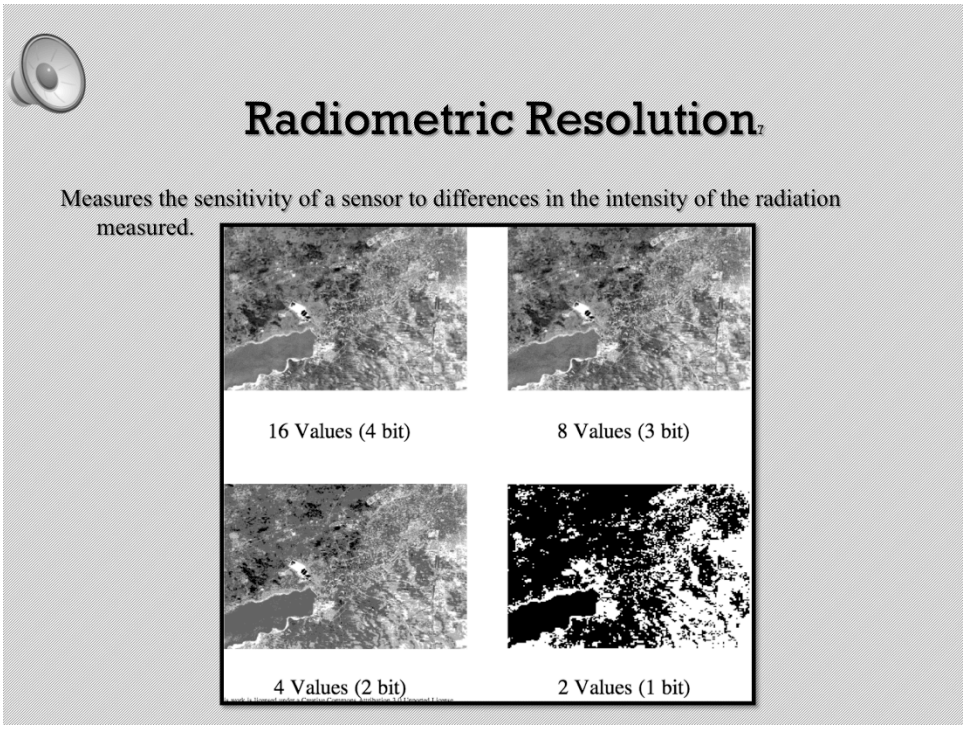


9

.By looking you can see the different sensitivities in comparing water, green grass, dry grass, and soil.a



Temporal measures how often and revisited data is obtained from the same area. As you can see we are gaining the same view but from a different time.

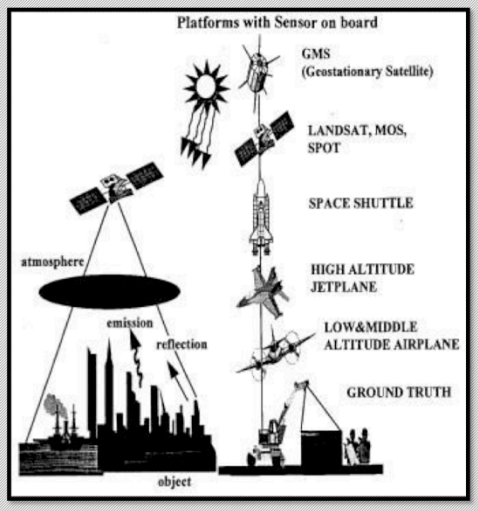


In this example we have 4 images of different intensities the sensor is able to distinguish.

Platforms

Any medium that holds a sensory item.

- Satellite (Telemetry)
- Balloons
- Airplane
- Rocket
- The Human Body



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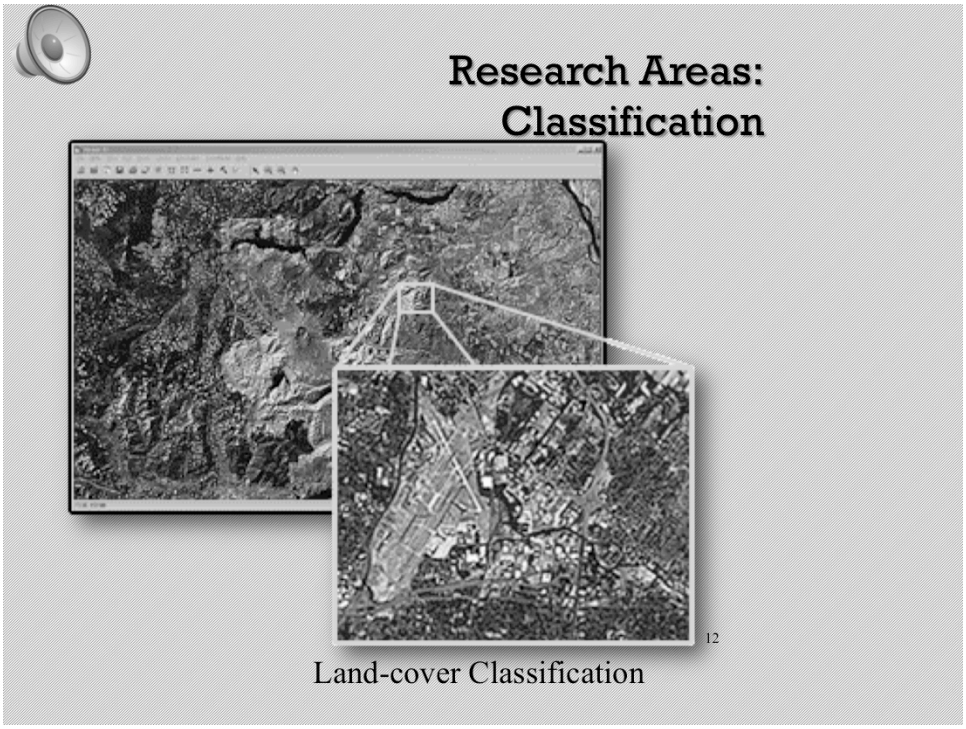
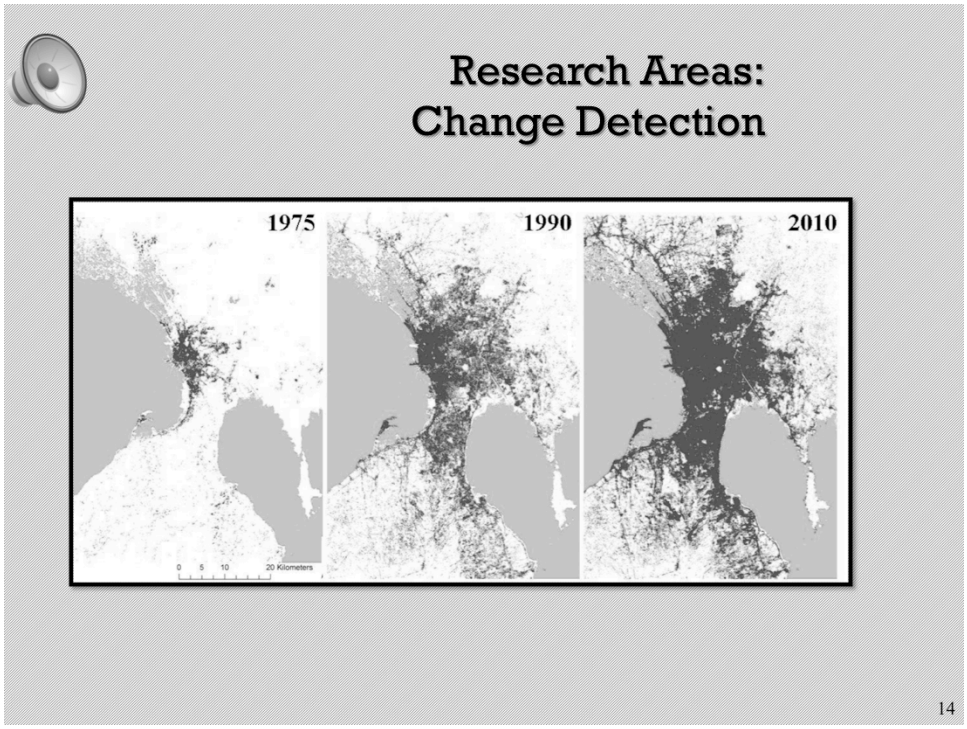
Platforms are any object that holds a sensor. In this example we see several platforms with sensors already on them and their order of intensity



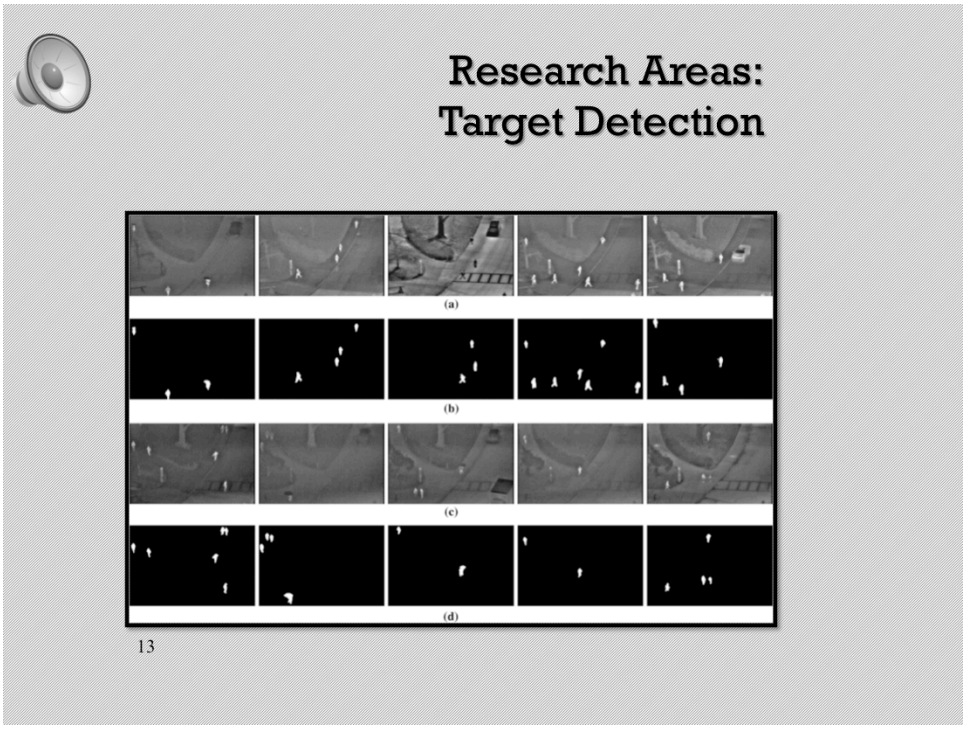
Finally, we have Remote research areas. These distinct features make up many uses for remote sensing.

Classification is figuring out what each pixel represents in a photo as a whole. In the example we see a land area, but when zoomed in we see it is a collection of places and things.
(Categorizes pixels in digital images of land cover classes to produce maps of land cover present.)



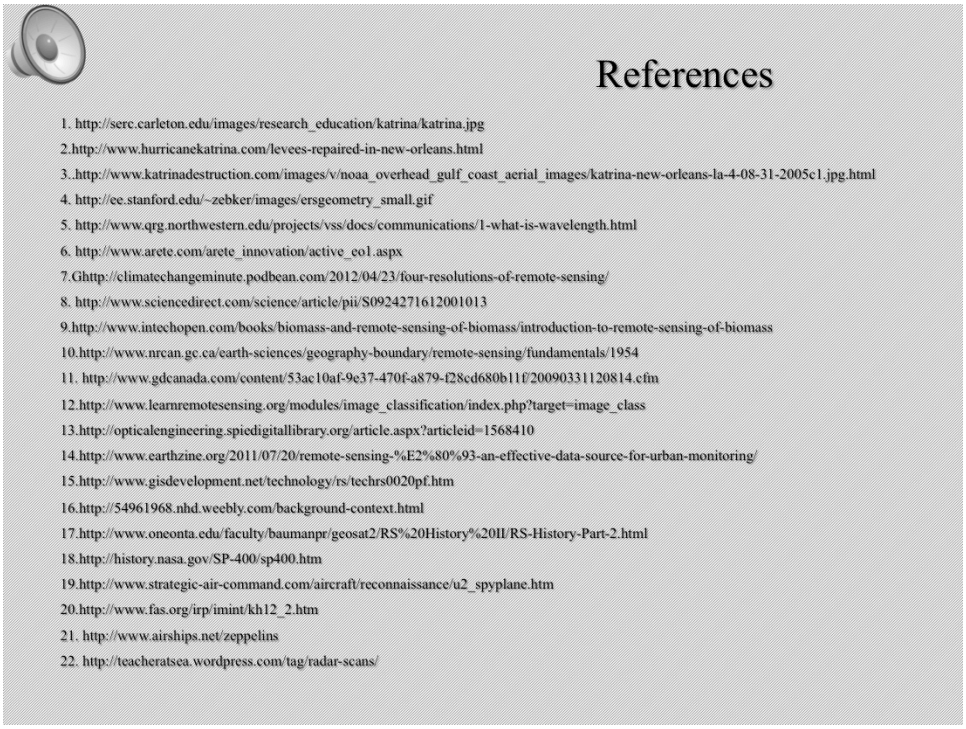
change detection shows the changes over a period of time. In this example we see the changes within urban sprawl over several years
There are several ways to show change detection Whether it be "abrupt vs subtle" "human vs natural" or "real vs detected")

(Detect change of landscape over time.)



and lastly,
Target detection: This is a specific thing you're looking for and is used to map feature locations with a particular spectral or spatial signature
(Used to map target or feature locations with a particular spectral or spatial signature.)

Spectral Unmixing:
(Provides information to monitor different natural resources. ie agriculture, forest, geological)



These are my resources and that is a basic understanding of remote sensing. you can now take the assessment to this powerpoint.

You can find more information at the following site

CERSER

http://cerser.ecsu.edu/