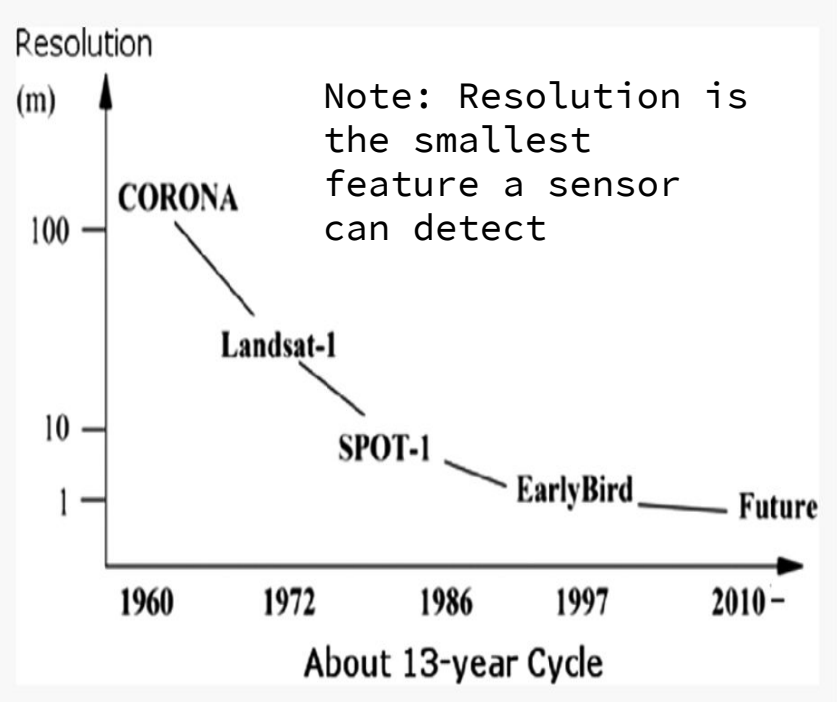
Satellites used for Remote sensing:

“Remote sensing” is how satellites collects these reflections – and just means sensing the energy bands from a remote place (like the Earth’s orbit)

Satellites used for remote sensing over generations:



Some Indian Satellites:

Resourcesat is part of the Indian remote sensing satellite system:

Resourcesat-01, was launched on October 17, 2003

Resourcesat-02, was the 18th remote sensing satellite designed and developed by ISRO.

Two types of sensors used in satellites:

1. Passive

   Passive sensors just collect the reflections (radiation) that are emitted from Earth, using the Sun’s energy as its source of electromagnetic radiation.

2. Active:

   Active sensing systems carry their own source of electromagnetic radiation, which is directed to the Earth’s surface.

Intro to file formats:

File formats of the images collected by the satellite depend on the propreitary company that is handling the satellite’s necessary right’s. So, there are different file formats for different groups of satellite handles by different organisations such as (NASA, ISRO, govts, etc).

Some widely used file formats:

CCRS format

EOSAT Fast Format

HDF Format

GeoTIFF Format

Fast-L7A Format

NOAA AVHRR and MODIS

HDF and GeoTiff:

HDF:

The **Hierarchical Data format** (HDF) for MODIS and AVHRR is a library and multi-object file format for the transfer of graphical and numerical data between machines. HDF is commonly used in scientific applications because of its portability between different systems and because of the self-describing nature of the format.

GeoTIFF Format:

IRS-P6 AWiFS Map orientated product is available in ***Geographic Tagged Image File Format*** (GeoTIFF). GeoTIFF offers the capability to embed a wide range of georeferencing information (e.g. projection, datums and ellipsoids, coordinate values) as compliant descriptive tags (metadata) and structures within the Tagged Image File Format (TIFF) file.

CEOS AND FAST FORMAT :

CEOS (Committee on Earth Observation Satellites):

The CEOS format image files are a combination of ASCII and Binary data. Metadata is contained with CEOS format data which can be accessed through reference to the CEOS format in combination with an appropriate data viewer. PRISM, AVNIR-2 and PALSAR CEOS format files contain the same structure but the metadata content and field sizes differ between the sensor.

The Fast Format (Version C): It contains an ASCII header file and separate files for each image band (band sequential structure - BSQ). There are no header records within the image file, nor are there prefix and/or suffix data in the individual image records. IRS-P6 Liss-III Path product is available in Fast Format and can be read directly in ENVI and PCI. ERDAS Imagine and ER-Mapper users can use image information in the header file to display and geo-reference the image file. The header file (*.hdr) include information such as image pixels/lines, projection/datum, four corner coordinates and orientation angle.

Some Satellites and their file formats:

Satellite	Sensor	Processing Level	File Formats
Landsat 5	TM	Path Image	**CCRS** EOSAT Fast Format
Landsat 5	TM	Map Oriented or Orthocorrected Image	**CCRS**, GeoTIFF EOSAT Fast Format
Landsat 2-5	MSS	All	CCRS
Landsat 7	ETM+	Raw - USGS L0R Raw - USGS L1R	HDF HDF
Landsat 7	ETM+	Path Image	**Fast-L7A** HDF
Landsat 7	ETM+	Map Oriented or Orthocorrected Image	**Fast-L7A**, GeoTIFF HDF

References:

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2. https://link.springer.com/chapter/10.1007/978-981-32-9915-3_3
3. https://www.ga.gov.au/scientific-topics/earth-obs/accessing-satellite-imagery/technical-information/file-formats