

History of Remote Sensing

The era of remote sensing is considered to have begun in 1858 when a balloonist, G. Tournachon (alias Nadar) took photographs of Paris from his balloon. Later, messenger pigeons, kites, aeroplanes, rockets and unmanned balloons were also used for early imaging. However, history of remote sensing can be linked with the development and understanding of optics and aeronautics. Aristotle (300BC) is credited with the first experiments on optics. Galileo Galilei (1609) and Sir Issac Newton (1666) scientifically explained optics and spectrometry. The systematic aerial photography began during the World War I for military surveillance and reconnaissance purposes. During World War I, aeroplanes were used on a large scale for these purposes as the aeroplanes were proved more reliable and stable platforms for Earth observation than balloons. However, the important developments of aerial photography and photo interpretation took place during World War II. During this time span, the development of other imaging systems such as near-infrared photography, thermal sensing and radar also took place.

The development of artificial satellites in the later half of the 20th century allowed remote sensing to progress to a global scale. As a consequence various Earth resources (e.g. Landsat) and weather (e.g. Nimbus) satellites and more recent missions such as RADARSAT and UARS provided global measurements of various data for civil, research, and military purposes. Table 1.1 gives a brief historical overview of development in the remote sensing technology. Space probes to other planets have also provided the opportunity to conduct remote sensing studies in extra terrestrial environments; synthetic aperture radar aboard the Magellan spacecraft provided detailed topographic maps of Venus, while instruments aboard SOHO allowed studies to be performed on the Sun and the solar wind, just to name a few examples.

Table 1.1 Major milestones in the history of remote sensing

Year	Milestones
1800	Discovery of infrared by Sir W. Herschel
1801	Theory of the perception of the colour by Thomas Young
1839	Beginning of practice of photography
1859	Photography from balloons
1873	Description of electromagnetic spectrum by J.C. Maxwell
1909	Photography from airplanes
1916	Aerial reconnaissance during the World War I
1935	Development of radar in Germany
1940	Applications of non-visible part of electromagnetic spectrum during World War II
1959	First space photograph of the Earth by Explorer-6
1960	Launch of the first TIROS meteorological satellite
1970	Skylab remote sensing observations from the space
1972	Launch of the first Earth resource satellite (Landsat-1)
1972	Rapid advances in digital image processing

1982 Launch of new generation of Landsat sensors (Landsat-4)
 1986 Launch of French Earth observation satellite (SPOT-1)
 1986 Development of hyperspectral sensors
 1990 Development of high resolution space borne systems
 1995 Launch of RADARSAT
 1998 Advancements towards low cost one-goal satellite missions
 1999 Launch of MODIS Terra EOS, Landsat-7 ETM+ and Earth observation satellites by commercial space agencies (IKONOS)
 2000 Launch of SRTM
 2002 Launch of ENVISAT, SPOT-5 and Launch of MODIS Aqua
 2006 Launch of RADARSAT-2

It would be appropriate here to also list major milestones in the history of Indian remote sensing as given in Table 1.2.

Table 1.2 Major milestones in the history of Indian remote sensing

(source: <http://isro.org/satellites/allsatellites.aspx>)

Year	Milestones
1920	First use of aerial photography
1962	Establishment of a rocket launching station
1972	Establishment of the Department of Space
1975	Launch of the First Indian satellite 'Aryabhata'
1979	Launch of the Earth observation satellite 'Bhaskara'
1982	Launch of INSAT-1A
1988	Launch of the First Indian Remote Sensing Satellite programme, IRS-1A
1991	Launch of IRS-1B
1994	Launch of IRS-P2
1995	Launch of INSAT-2C
1997	Launch of IRS-1D
1999	Launch of OCEANSAT-1 (IRS-P4)
2001	Launch of the GSAT-1 and Technology Evaluation Satellite (TES)
2002	Launch of KALPANA (METSAT)
2003	Launch of RESOURCESAT-1 (IRS-P6)
2005	Launch of CARTOSAT-1 (IRS-P6)
2007	Launch of CARTOSAT-2
2008	Launch of Chandrayaan-1
2009	Launch of ANUSAT, OCEANSAT-2 and RISAT-2
2010	Launch of CARTOSAT-2B
2011	Launch of YOUTHSAT, RESOURCESAT-2 and Megha-Tropiques

Recent developments include, beginning in the 1960s and 1970s, with the development of computer processing of satellite images. Following the successful demonstration flights of Bhaskara-1 and Bhaskara-2 satellites launched in 1979 and 1981, respectively, India began to develop the indigenous Indian Remote Sensing Satellite (IRS) series of satellites to support the national economy in the areas of agriculture, water resources, forestry and ecology, geology, marine fisheries and coastal management. Data from the IRS series is received and disseminated by several countries all over the world. With the advent of high-resolution satellites new applications in the areas of urban sprawl, infrastructure planning and other large scale applications for mapping have been initiated. The IRS series of satellites is the largest constellation of remote sensing satellites for civilian use in operation today in the world. These satellites are placed in polar sun-synchronous orbit and provide data in a variety of spatial, spectral and temporal resolutions.

References: <http://egyankosh.ac.in/handle/123456789/39605>