

You can do it! Remote Sensing Analysis

Part 2: Sensors on the Satellites and the Contents of the Data

(1) How accurate is remote sensing analysis ?

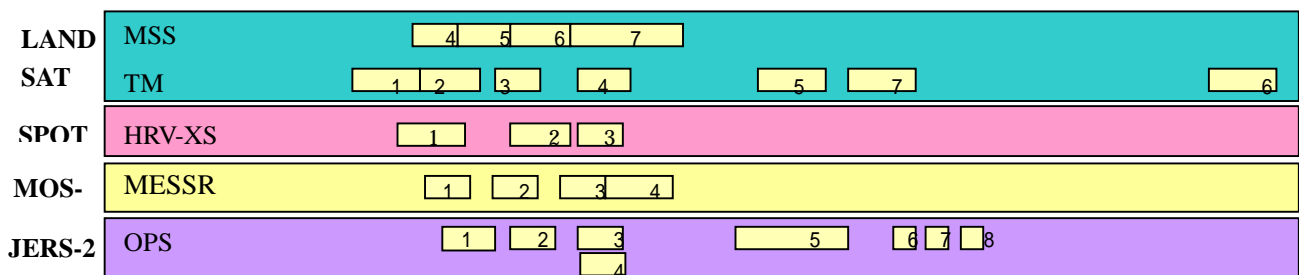
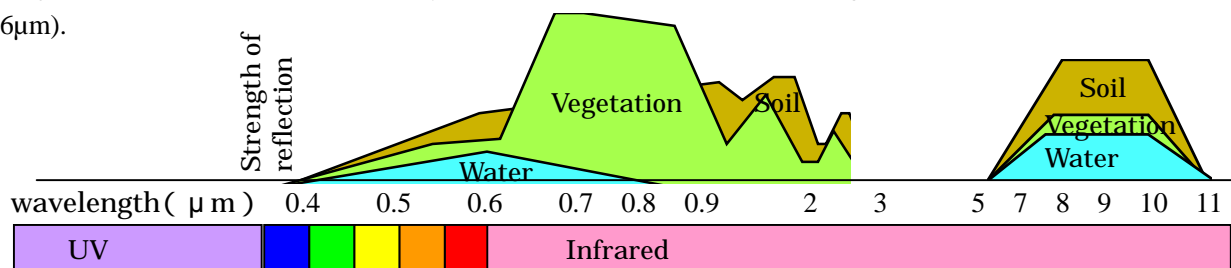
Satellites are flying over 500km away from the ground. Although accuracy of sensors are improving gradually, the minimum resolution of the most sensitive sensor is 10m. The data we can usually obtain is less accurate, the minimum resolution is 20-80m. As a result, it is impossible to analyze an object smaller than that, such as a flower in a small garden. Let us hope for innovations of the technology in the future.

Satellite	Band	Resolution (m)	Operation	
Landsat (TM)	USA	7	30m	1988
Landsat (MSS)	USA	4	80m	1972
SPOT	FRS	3	20m	1986
JERS-1	JPN	8	20m	1992
(Fuyo No.1)	SAR*			
MOS-1 (Momo-No.1)	JPN	4	50m	1990

SAR: Synthetic Aperture Radar

(2) What are the contents of the data ?

We human beings recognize colors of objects by their reflection of light called visible light. Sensors on the satellites distinguish colors completely differently. As shown below, each sensor detects reflection of a specific wavelength zone and records the data numerically by classifying the strength of the reflection into 256 grades. Wavelength to be used is specified according to the purpose of research. For example, when water is the object of a research, the data taken by the sensor best fits for the wavelength zone of water should be used (0.6μm).



	TM	MSS	SPOT	MOS-1	JERS-1	DISTINCTION
	B-range	B-range	B-range	B-range	B-range	
Visible (B-G)	1 0.45-0.52					Deciduous trees/ conifers
Visible (G)	2 0.25-0.60	4 0.5-0.6	1 0.50-0.59	1 0.15-0.59	1 0.52-0.60	Plant vigor index
Visible (R)	3 0.63-0.69	5 0.6-0.7	2 0.61-0.68	2 0.61-0.69	2 0.63-0.69	
Near infrared	4 0.76-0.90	6 0.7-0.8	3 0.79-0.89	3 0.72-0.80	3 0.76-0.8	Distinction of plants
				4 0.80-1.10	4 0.76-0.86	
Intermediate infrared	5 1.55-1.75	7 0.8-1.1			5 1.60-1.71	Distinction of sea and land
	7 2.08-2.35				6 2.01-2.12	Identification of plants mass
					7 2.13-2.25	
					8 2.27-2.40	
Thermal infrared	6 10.4-12.5					Estimating ground/ sea surface temp.