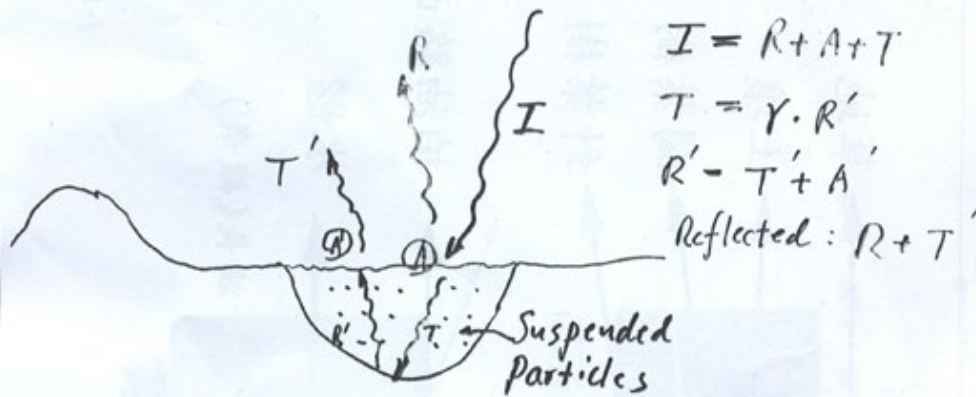
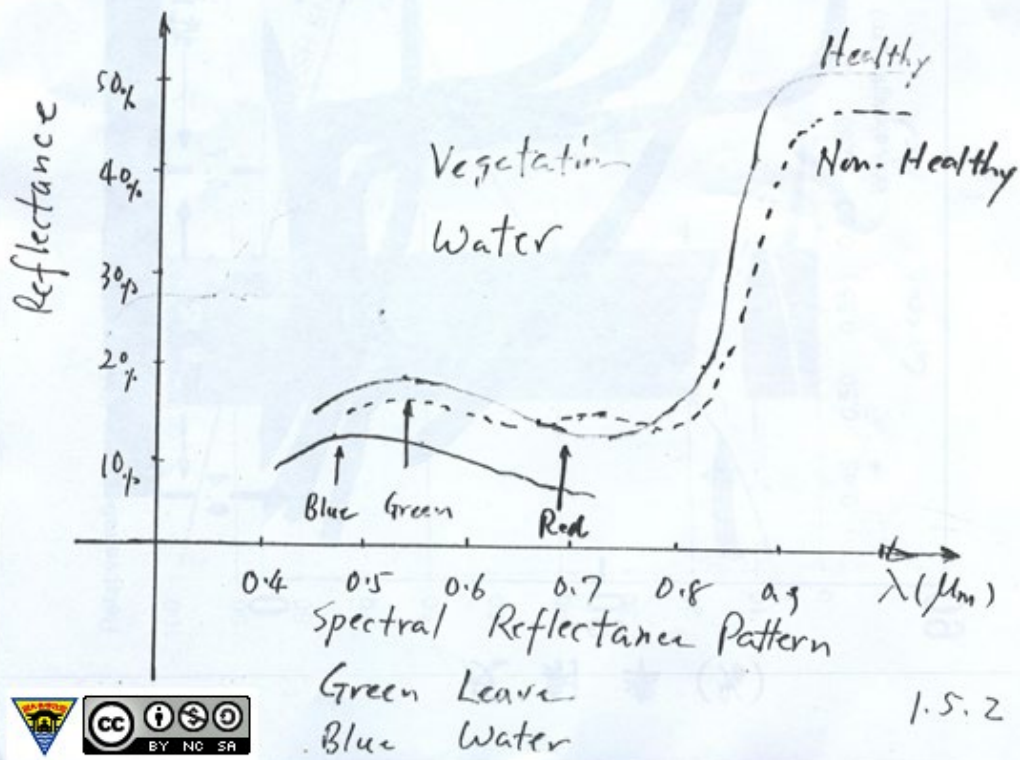
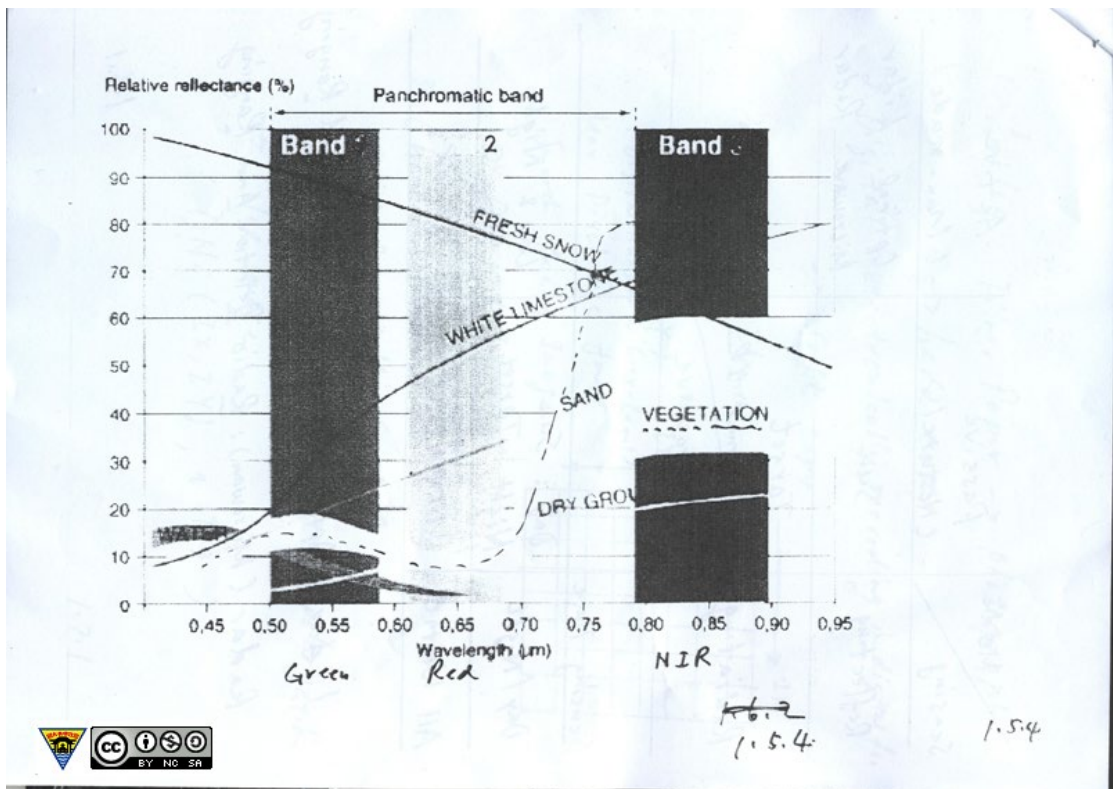
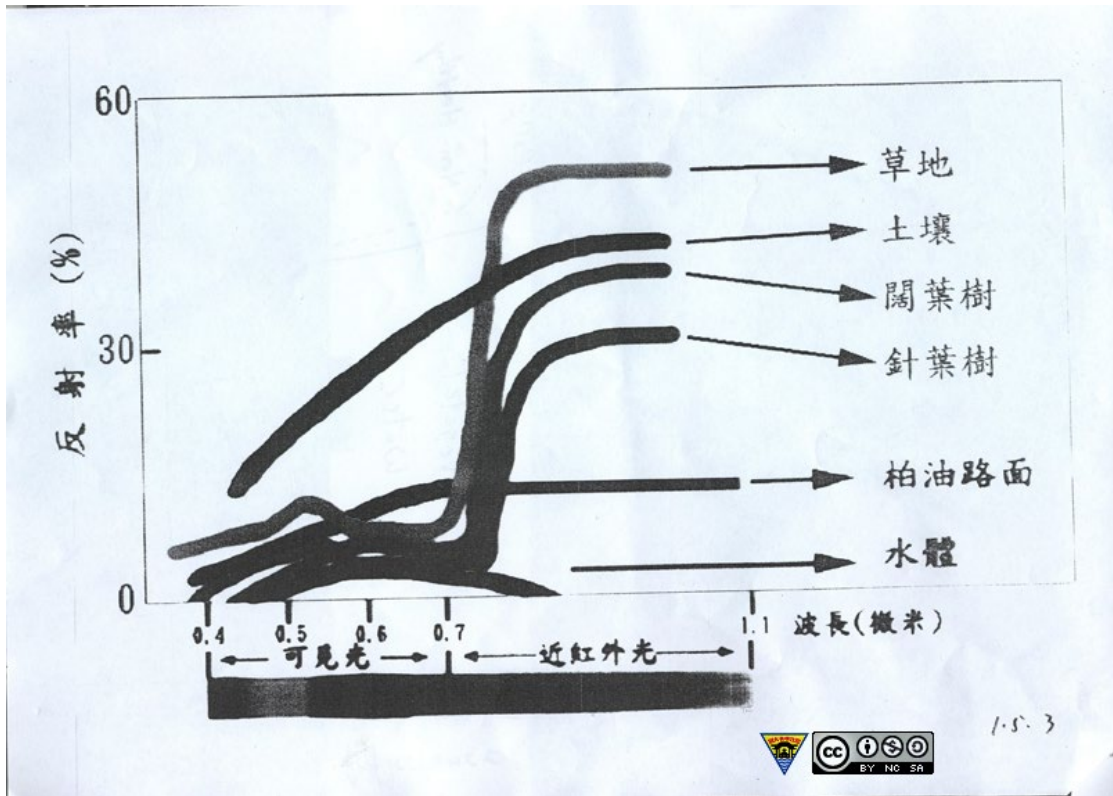


$$\text{Reflectance}(\lambda) = \frac{\text{Reflected Energy}(\lambda)}{\text{Incident Energy}(\lambda)}$$



Interaction with Water-body





Mode \ Sensing	Passive (Natural)	Active (Man-made)
Reflecting	Sun	Optical: Lidar Microwave: Radar
Radiating	Target - Thermal IR - Microwave	
Sensing Time		
Day / Night	Day: Sun Night: Target	Day & Night
All Weather	Microwave (Target)	Radar

Lidar (Optical): Light Detection And Ranging

Radar (Microwave): Radio Detection And Ranging

1.6.1



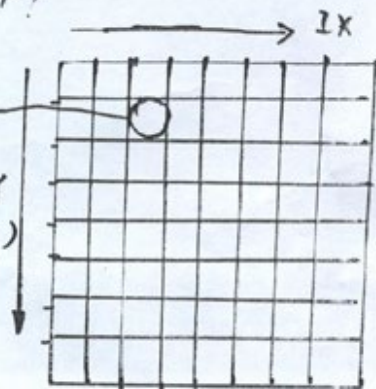
## Image

1. Analog : Film, Paper  $\rightarrow$  Photograph  
 $\rightarrow$  hard copy
2. Digital : Electronically recording in digital form  
 $\rightarrow$  Soft copy

Pixel : Picture Element  
x

$DN(I_X, I_Y)$   $I_Y$   
(Digital Number or Grey-Level)  
Max. Pixel Size for  
Smooth Analog Image

$\approx 200 \mu$  (Empirical)



3. Channel (Band) :  
Optical : Multi-Spectral  
Microwave : Multi-frequency, polarization  
 $\rightarrow$  Color Image  
(  $DN_i(I_X, I_Y)$ ,  $i=1, 3$  )

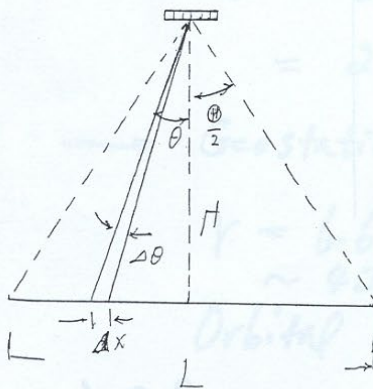
1.7.1

Table 5.1.1 Platform types and observation objects

platform	altitude	observation	remarks
geostationary satellite	36,000m	fixed point observation	GMS
circular orbit satellite (earth observation)	500km - 1,000km	regular observation	Landsat, SPOT, MOS-1, etc
space shuttle	240km - 350km	irregular observation space experiment	
radio-sonde	100m - 100km	various investigations (meteorological, etc)	
high altitude jet-plane	10km - 12km	reconnaissance wide area investigations	
low or middle altitude plane	500m - 8,000m	various investigation aero surveys	
aerostat	500m - 3,000m	reconnaissance various investigations	
helicopter	100m - 2,000m	various investigations aero surveys	
radio-controlled plane	below 500m	various investigations aero surveys	acroplane helicopter
hang-plane	50 - 500m	various investigations aero surveys	hang-glider para-glider
hang-balloon	800m -	various investigations	
cable	10 - 40m	archeologic investigations	
crane car	5 - 50m	close range surveys	
ground measurement car	0 - 30m	ground truth	cherry picker

ER  
RadarSat

pilotes



H: Platform Height  
 $\Delta\theta$ : Instant Field of View, IFOV  
 $\theta$ : Field of View, FOV  
 L: Swath Width  
 $\theta$ : View Angle w.r.t. Nadir  
 $\Delta x$ : Ground Resolution  
 $\Delta x = H / \cos^2\theta \cdot \Delta\theta$   
 $L = 2H \cdot \tan(\frac{\theta}{2})$

2.1

Platform Characteristic	Air-borne	Satellite
机动性	佳	固定
覆盖范围	小 ~ 5公里	大 ~ 60-200公里 ~ 10-24公里
地面分辨率	高 公里~米	中: 2.5~30米 高: <1~2米

2.2.1

