


Remote Sensing Systems Characteristics

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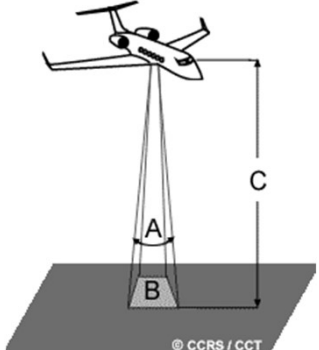
Resolutions

- Spatial Resolution
- Spectral Resolution
- Radiometric Resolution
- Temporal Resolution

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Spatial Resolution




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Spatial Resolution

Coarse Spatial Resolution

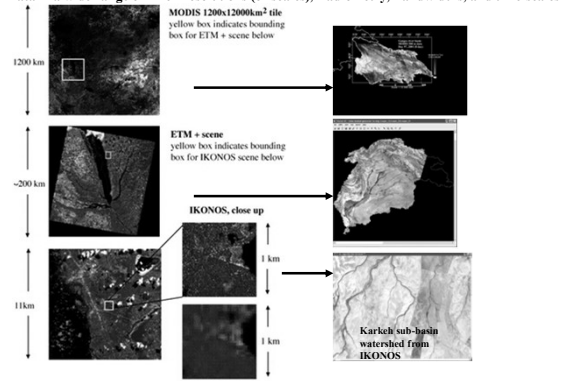


Fine Spatial Resolution




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Data in a wide range of Pixel Resolutions (or scales), Radiometry, Bandwidths, and time-scales

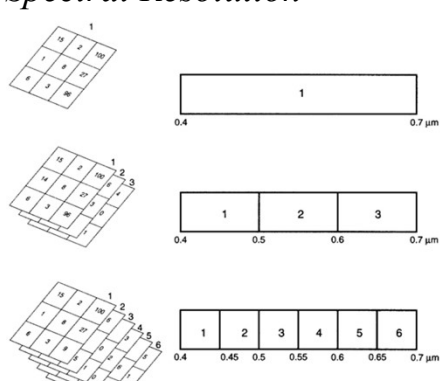


False color composite image (red = 850 nm, green = 650 nm, blue = 555 nm) of MODIS, ETM+ and IKONOS imagery (Left image Courtesy: Morisette et al., 2002).

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Spectral Resolution



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Spectral Resolution (Contd..)

TM Band 1
0.45–0.52 μm
(blue)

TM Band 2
0.52–0.60 μm
(green)

TM Band 3
0.63–0.69 μm
(red)

TM Band 4
0.75–0.90 μm
(near-infrared)

TM Band 5
1.55–1.75 μm
(mid-infrared)

TM Band 6
10.4–12.5 μm
(thermal-infrared)

TM Band 7
2.08–2.35 μm
(mid-infrared)

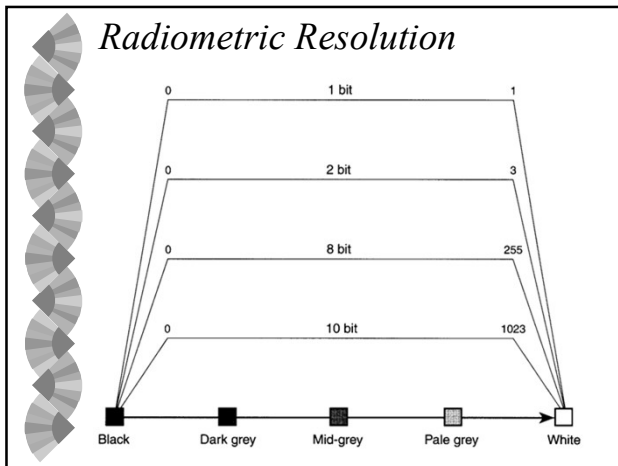
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Radiometric Resolution

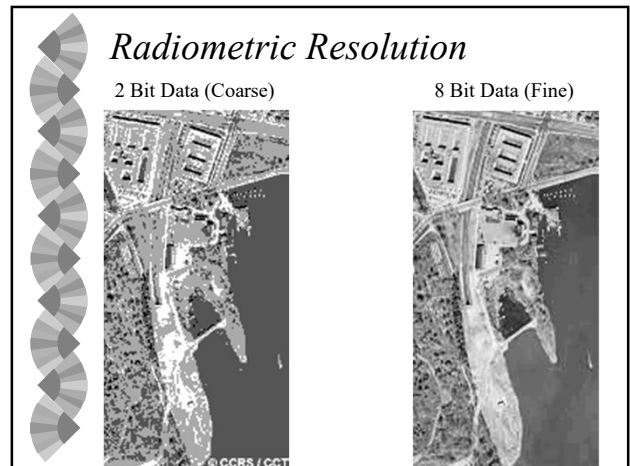
- Radiometric resolution of a sensor is a measure of how many grey levels are measured between pure black (no reflectance) to pure white.
- Is measured in bits
 - 1 bit (2^1) – 2 levels
 - 7 bits (2^7) – 128 levels
 - 8 bits (2^8) – 256 levels
 - 11 bits (2^{11}) – 2048 levels
- In an 8 bit system, black is measured as 0 and white is measured as 255.
- For comparison across bands, all the bands should have same radiometric resolution.

Examples
IRS 1A & 1B
Landsat TM
NOAA - AVHRR

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Temporal Resolution

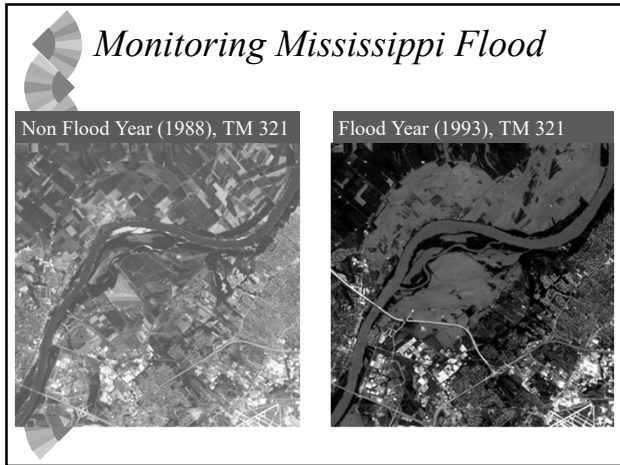
- Temporal resolution of a RS system is a measure of how often data are obtained for the same area
 - Applicable to satellite RS only
- Temporal resolution varies from less than one hour to approximately 30 days.

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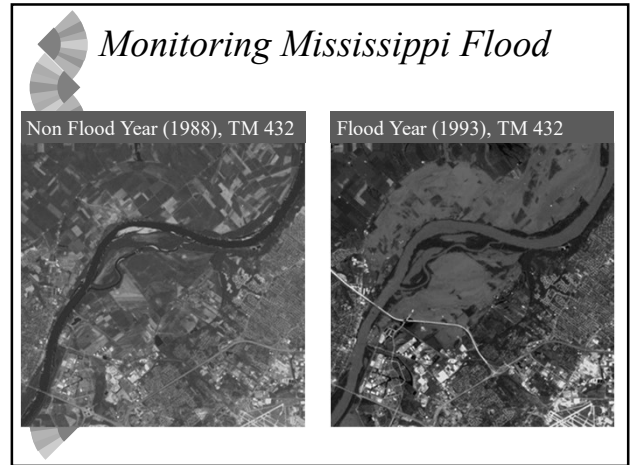
Importance of Temporal Resolution

- Change in Land Use/ Land Cover
- Temporal Variation
- Monitoring of a Dynamic Event
 - Cyclone
 - Flood
 - Volcano
 - Earthquake

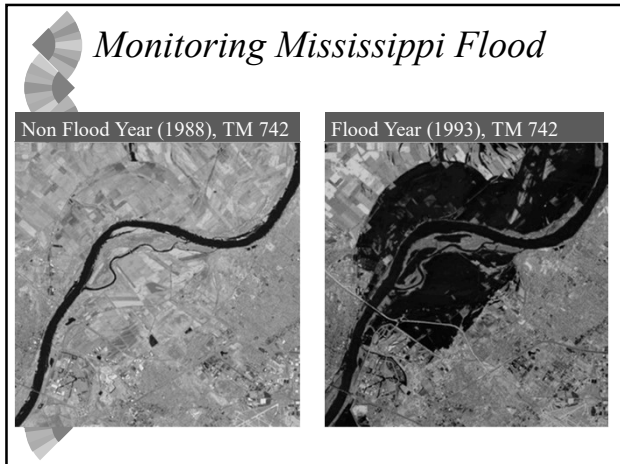
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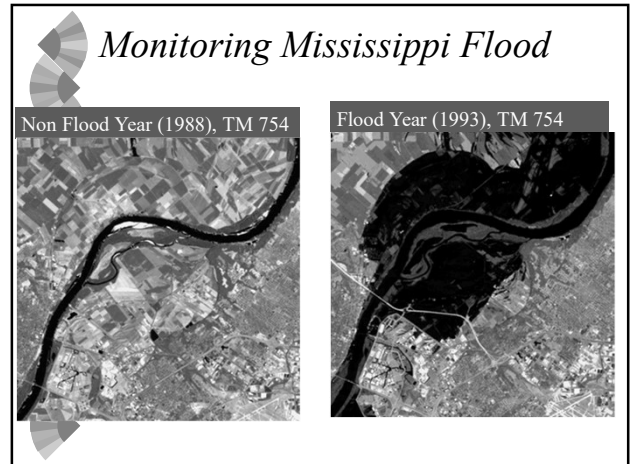
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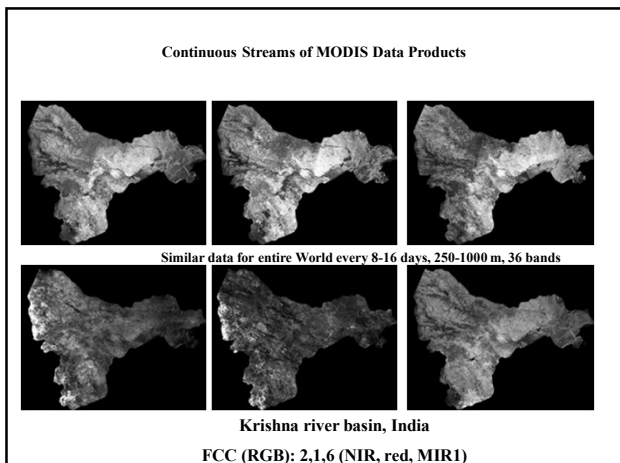
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