

Guide: Imagery Processing Decision Tables

URL: <https://www.pgc.umn.edu/guides/commercial-imagery/imagery-processing-decision-tables/>

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Information for users to decide what imagery processing stretch and bit depth options are most appropriate for varying purposes.

Imagery Stretch & Bit Depth Outline

	Byte (8-bit integer)	UInt16 (16-bit integer)	Float32 (32-bit Decimal)
No stretch (ns)	Not Applicable	Terrain Corrected with digital number (DN) values	Not Applicable
Reflectance (rf)	Optimized image contrast over snow and ice surfaces	Comparative analysis between multiple images or cross-sensor imagery	Spectral response analysis
Modified reflectance (mr)	Optimized image contrast in temperate or tropical regions	Not Applicable	Not Applicable
Radiance (rd)	Not Applicable	Not Applicable	Use in atmosphere correction model

Imagery Stretch & Bit Depth Use Cases

Purpose	UInt16 ns	Byte rf	Byte mr	UInt16 rf	Float32 rf	Float32 rd
Comparison & analysis between multi-temporal images	■	●	●	●	●	●
Visual interpretation of snow/ice regions (Antarctica/Greenland)	■	● ¹	■	○	○	○
Visual interpretation of diverse land cover (nonpolar/vegetation)	■	■	● ^{1,2}	○	○	○
Full 11-bit radiometric depth	■	■	■	●	●	●
Reflectance values (TOA)	■	○ ³	■	○ ³	●	
Radiance values (absolute)	■	■	■	■	■	●
Original digital number values (no radiometric calibration)	●	■	■	■	■	■
Has an absolute unit		Percent reflectance scaled to 200	N/A	Percent reflectance scaled to 2000	Percent reflectance	w/m ² /str

■ not recommended ○ appropriate ● optimal

¹ - 8-bit rasters are rendered faster than 16 or 32 bit data. A GIS does not have to apply a histogram stretch to take

11 to 32 bits of data and render them in 8-bit. However, radiometric detail in shadows or very bright areas may be lost in reducing the data to 8 bit.

² - Modified reflectance is based on reflectance, but shifted to enhance darker pixels. It's useful to make non-ice-covered areas bright enough interpret, but pixel values are not a valid percent reflectance value.

³ - Reflectance values scaled to fit into an integer package.