

**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

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

## Imagery Stretch & Bit Depth Use Cases

<b>Purpose</b>	<b>UInt16 ns</b>	<b>Byte rf</b>	<b>Byte mr</b>	<b>UInt16 rf</b>	<b>Float32 rf</b>	<b>Float32 rd</b>
Comparison & analysis between multi-temporal images	■	●	●	●	●	●
Visual interpretation of snow/ice regions (Antarctica/Greenland)	■	● <sup>1</sup>	■	○	○	○
Visual interpretation of diverse land cover (nonpolar/vegetation)	■	■	● <sup>1,2</sup>	○	○	○
Full 11-bit radiometric depth	■	■	■	●	●	●
Reflectance values (TOA)	■	○ <sup>3</sup>	■	○ <sup>3</sup>	●	
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 <sup>2</sup> /str

■ not recommended      ○ appropriate      ● optimal

<sup>1</sup> - 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.

<sup>2</sup> - 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.

<sup>3</sup> - Reflectance values scaled to fit into an integer package.