

WikiCAP

Orthoimage technical specifications for the purpose of LPIS

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DQ Sub elements	Conformance Quality Level & Tolerance Limits	Notes	Expected rate of conforming items
Spatial resolution	$\leq 0.5\text{m}$ ^[1]	Ratio of the final ortho resolution to the GSD is 1:1 for digital sensors, whereas for film cameras should be at least 1.2:1	100%
Radiometric resolution	$\Rightarrow 8$ bits/channel	11-12 bits per channel is highly recommended	100%
Spectral Resolution	Color (natural or color infrared)	Panchromatic only (satellite or aerial) data is allowed, only if there is no option for color imagery	100%
General Image Quality	Lack of defects and artifacts, which could prevent the visual interpretation of the image	Checking for existence of scratches, dust, threads, hot spots, haze, drop lines, shadows, color seams, spilling, artifacts, etc	N/A (no defects allowed)
Cloud cover	$< 5-10\%$	Per image and in total. The term "image" is used for the 'control unit' e.g. orthoimage, mosaic (map sheet)	100%
Overall clipping	$< 0.5\%$ at each tail	The clipping metric is calculated on the luminosity histogram . The first 5 and last 5 bins of the histogram can be considered as belonging to the tail.	See the following article

Histogram Peak	+/-15% of middle value	For 8 bit image, the middle value is 128	See the following article
Color balance	<2% between min and max value of triplet	Difference between the minimum and maximum digital counts in the triplet calculated on nearly "neutral" objects (such as paved roads or building tops). This measure is not applicable for panchromatic only imagery.	See the following article
Noise	Signal to Noise Ratio > 5 for each channel	SNR which is defined as the ratio of the mean DN value to the standard deviation of the DN values (calculated on areas of uniform density of middle values)	See the following article
Contrast	The coefficient of variation of the image DN values should be in the range of 10-20%	Represented as the Standard Deviation of the DN values as a percentage of the available grey levels	See the following article
Geometric accuracy	RMSE _x ≤ 1.25 m; RMSE _y ≤ 1.25 m [2]	RMSE is calculated on the base of at least 20 well distributed independent check points (ICP), per image	100%
Mosaicking	DN values variation on similar area type not to exceed 10% in average (or 4% between each of the 3 channels)	.	See the following article
Mosaicking	Geometric mismatches along seam lines (d) <3 pixels	.	100%
Compression	Lossless (TIF, LZW-TIF).	Visually lossless (JPEG2000, ECW, MrSID) is allowed for archiving purposes only.	100%

For more information on the quality assurance and quality check, please refer to: [1] (<https://g4cap.jrc.ec.europa.eu/g4cap/Portals/0/Documents/10133.pdf?ver=2016-03-31-115702-183>)

Detailed reference information on the calculation of certain quality metrics can be found in:

- **Image radiometric quality assurance** - under constructions
 - (NAIP) Suggested Best Practices – Final Report (http://www.fsa.usda.gov/Internet/FSA_File/naip_best_practice.pdf)
 - SNR - wikipedia (http://en.wikipedia.org/wiki/Signal-to-noise_ratio#Alternative_definition)
- Spatial resolution ≤ 1.0 m, if orthomagey is acquired on the basis of long-term contracts that were agreed before November 2012
 - RMSE 1-d ≤ 2.5 m, if orthomagey is acquired on the basis of long-term contracts that were agreed before November 2012

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