LAND MANAGEMENT, ENVIRONMENT & SOLID-WASTE: INSIDE EDUCATION AND BUSINESS IN CENTRAL ASIA
ERASMUS-EDU-2023-CBHE Project Number: 101129032

MICRO-CREDENTIAL

LAND MANAGEMENT IN CENTRAL ASIA

13.- Image Interpretation and Digital Image Processing

Quiz

Week 13 – Image Processing

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Quiz: Visual Interpretation and Digital Processing of Remote Sensing Images

20 multiple-choice questions • 1 point each • Total: 20 points

Student name	
Group	
Date	
Score	/ 20

Instructions

- Choose the best answer for each question.
- Use evidence-based reasoning: connect your answer to pixels, bands, enhancement, classification, validation, or land-cover mapping workflow.
- Only one answer is correct for each question.
- Recommended time: 25–30 minutes.

Quiz Questions

1. Which statement best describes digital image processing in remote sensing?

A. Drawing maps by hand from field notebooks only.
B. Using computer-based methods to improve or analyze image data.
C. Replacing all field validation with visual estimation.
D. Collecting soil samples without using satellite imagery.

2. In a raster remote sensing image, what does a pixel normally represent?

A. A printed map symbol only.
B. The smallest image unit that stores a value for a specific ground location.
C. A vector boundary line around a field.
D. A text label attached to a map legend.

3. What is the main role of spectral bands in satellite imagery?

A. They record reflected or emitted energy in different parts of the electromagnetic spectrum.
B. They remove the need for georeferencing.
C. They automatically name all land-use categories.
D. They convert all images into black-and-white photographs.

4. Which interpretation element is most directly related to brightness or hue in an image?

A. Site
B. Tone/color
C. Association
D. Scale bar

5. Why should an interpreter avoid relying on color alone?

A. Color always has the same meaning in every band combination.
B. Color may change with band combination, season, moisture, illumination, and display settings.
C. Color cannot be displayed in digital imagery.
D. Color is only useful in printed maps, not satellite images.

6. Which visual clue is most useful for recognizing center-pivot irrigation fields?

A. Circular shape
B. Random shadow
C. Unknown metadata
D. Cloud mask

7. What is the main purpose of radiometric correction?

A. To delete the coordinate system from an image.

B. To reduce sensor and atmospheric effects so pixel values better represent surface conditions.
C. To change all image pixels into vector polygons.
D. To create a final map layout with north arrow and scale.

8. What does geometric correction mainly improve?

A. The spatial alignment of the image with real-world coordinates and other map layers.
B. The number of answer choices in a quiz.
C. The historical length of the Landsat archive.
D. The rainfall amount during image acquisition.

9. Which step is especially important before comparing satellite images from two different dates?

A. Consistent preprocessing and registration
B. Removing all metadata
C. Changing the class names randomly
D. Ignoring clouds and shadows

10. What is the purpose of image enhancement?

A. To make useful details easier to see and interpret.
B. To prove that the image is always more accurate than field data.
C. To replace classification accuracy assessment.
D. To change the real land surface on the ground.

11. Which enhancement method expands a narrow range of brightness values to improve visual contrast?

A. Contrast stretching
B. Ground control survey
C. Random sampling
D. Coordinate projection

12. A low-pass or smoothing filter is commonly used to:

A. Increase random noise in the image.
B. Reduce small local variation and make areas appear more homogeneous.
C. Remove the need for classification.
D. Convert a raster image into a legal land certificate.

13. High-pass filters and edge enhancement are useful because they:

A. Hide roads and field boundaries.
B. Emphasize abrupt brightness changes such as roads, channels, and parcel edges.
C. Remove all information from neighboring pixels.
D. Automatically validate a land-cover map.

14. What does supervised classification require?

A. Known training samples for the classes of interest.
B. No class labels and no reference information.
C. Only a printed photograph without pixel values.
D. A map legend but no imagery.

15. In unsupervised classification, pixels are first:

A. Grouped automatically according to similarity.
B. Assigned to official cadastral ownership records.
C. Deleted if they are vegetation pixels.
D. Converted into field interview answers.

16. Which statement best describes object-based image classification?

A. It classifies only one isolated pixel at a time and ignores shape.
B. It groups neighboring pixels into image segments and may use shape, texture, and context.
C. It is only possible with paper maps.
D. It cannot be used for high-resolution images.

17. What is the purpose of a confusion matrix in classification assessment?

A. To compare mapped classes with reference data and summarize classification errors.
B. To choose the color of the title page.
C. To remove all mixed pixels from the original image.
D. To calculate the orbit height of the satellite only.

18. Which example represents land cover rather than land use?

A. Water surface
B. Recreation
C. Residential function
D. Transport policy

19. Which index is commonly used to highlight vegetation vigor?

A. NDVI
B. NDBI only
C. Map scale
D. Page number

20. Which challenge can reduce confidence in land-cover interpretation and mapping?

A. Clouds, shadows, mixed pixels, seasonal change, and spectral confusion.
B. Using a clear class legend and validation samples.
C. Documenting preprocessing steps.
D. Choosing image resolution according to the study objective.

Student Answer Sheet

Write the selected letter for each question. This sheet may be used for quick checking.

1		2		3		4	
5		6		7		8	
9		10		11		12	
13		14		15		16	
17		18		19		20	

Instructor Answer Key

1	B	2	B	3	A	4	B
5	B	6	A	7	B	8	A
9	A	10	A	11	A	12	B
13	B	14	A	15	A	16	B
17	A	18	A	19	A	20	A

Scoring guide: 18-20 excellent; 15-17 good; 11-14 basic understanding; 0-10 additional review needed.

Source basis: Week 13 LESLIE lecture materials and standard remote sensing references by Jensen; Lillesand, Kiefer & Chipman; Campbell & Wynne; Richards, plus NASA Earth Observatory, USGS EROS/Landsat, and ESA/Copernicus learning resources.

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