

Image interpretation and project schedule

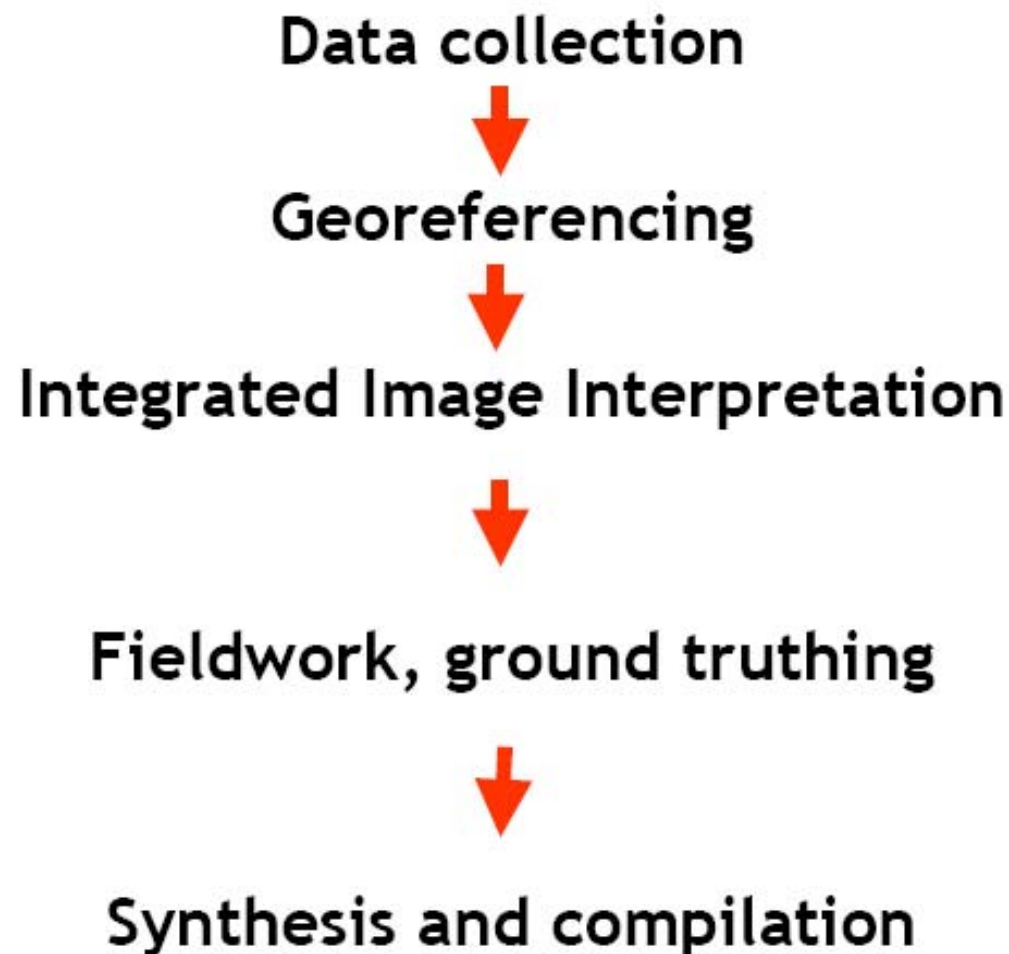


Image Interpretation - Definition

Image interpretation can be defined as:

- The study of the imaged objects using the image/photo interpretation criterias,
- The extraction of those features relevant to the object of study,
- The analysis of the selected features with the objective to come to a deduction of their significance for the specific field of study.

MANUAL vs. DIGITAL ANALYSIS

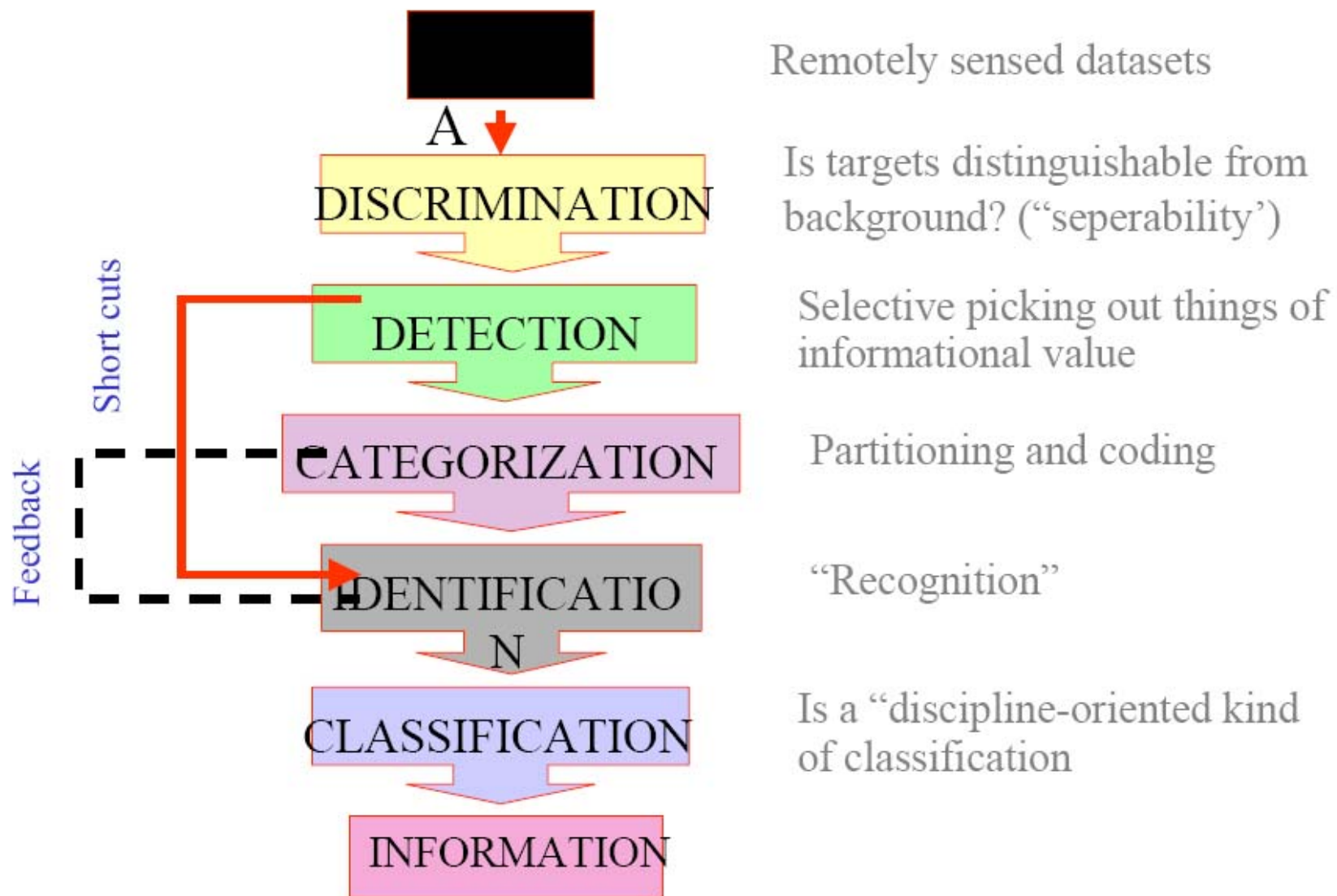
MANUAL INTERPRETATION

- Traditional: intuitive.
- Simple, inexpensive equipment.
- Uses brightness and Spatial content of the image.
- Usually single channel data or three channels at most.
- Subjective, concrete, qualitative.

DIGITAL INTERPRETATION

- Recent: requires specialized training
- Complex, expensive equip.
- Relies chiefly upon brightness and spectral content, limited spatial.
- Frequent use of data from several channels.
- Objective, abstract, quantitative.

Different steps in image analysis

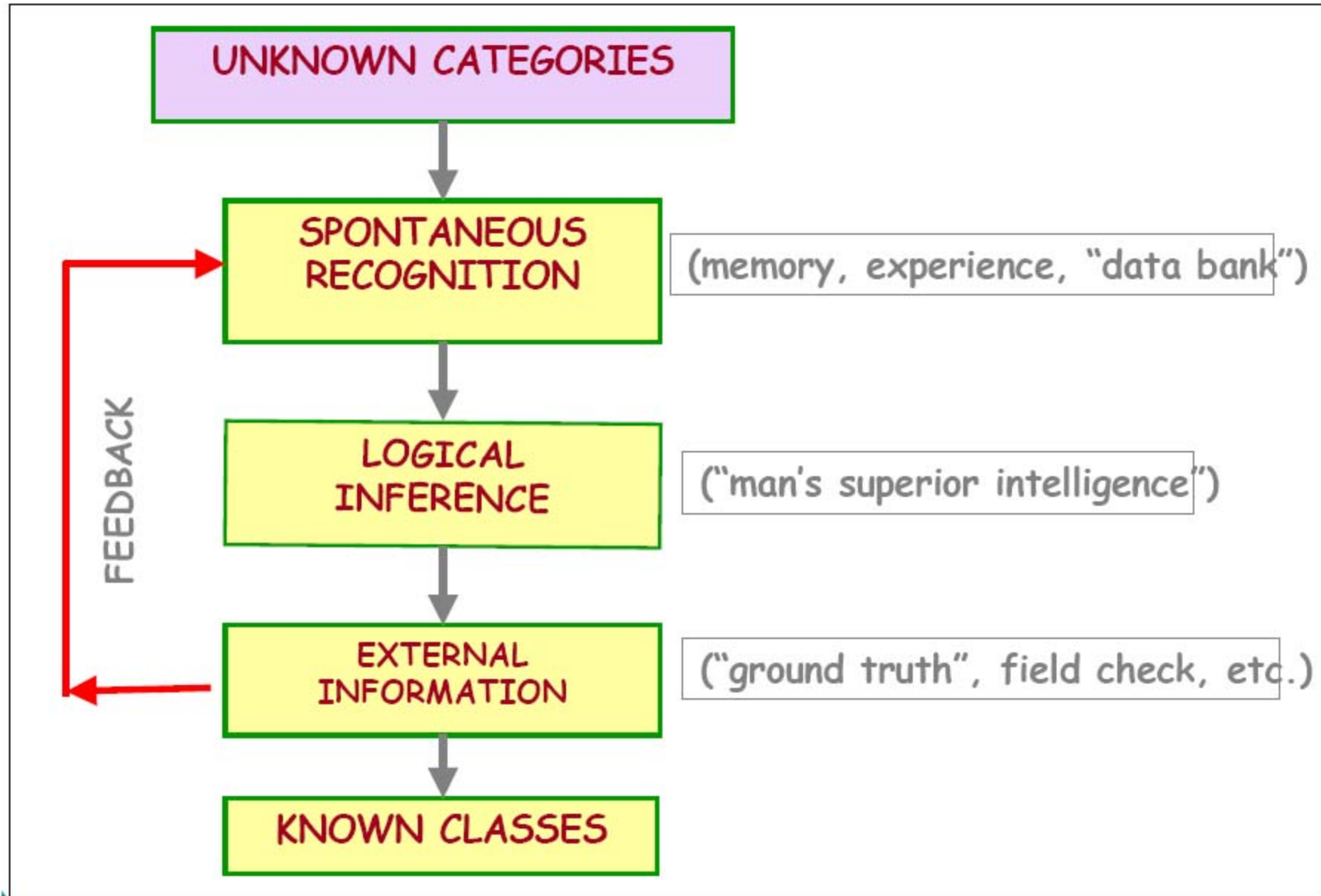


IDENTIFICATION

IDENTIFICATION
IS A RECOGNITION
PROCESS

YOU CAN ONLY
IDENTIFY
SOMETHING BY
COMPARING IT
WITH
SOMETHING ELSE
WHICH YOU
ALREADY HAVE
GIVEN A NAME

RECOGNITION PROCESS IN VISUAL ANALYSIS



The result of an image interpretation

The result of an image interpretation
is a function of the
reference level of the image interpreter

determined by:

- professional knowledge
- experience in image interpretation
- local knowledge

Aerial photography vs Remote Sensing

Often black & White

Colour, also non-visible

Airborne

Airborne, Spaceborne

Analogue

Digital

Small data volumes

Large data volumes

Limited spectral coverage

Ext. spectral coverage

High spatial resolution

Recent systems:
also High Spat. Resolution

Aerial Photo Interpretation

Human eye evaluates 7 criteria



Association



Pattern



Shadow



Shape



Size



Texture



Tone

colour

the interpretation element: TONE

Tone = Density value

Variations in greytone are the main interpretation element used in differentiating landuse in this image.

The dark greytones correspond to forested areas.

The lighter greytones correspond to agriculture fields with different types of crops.

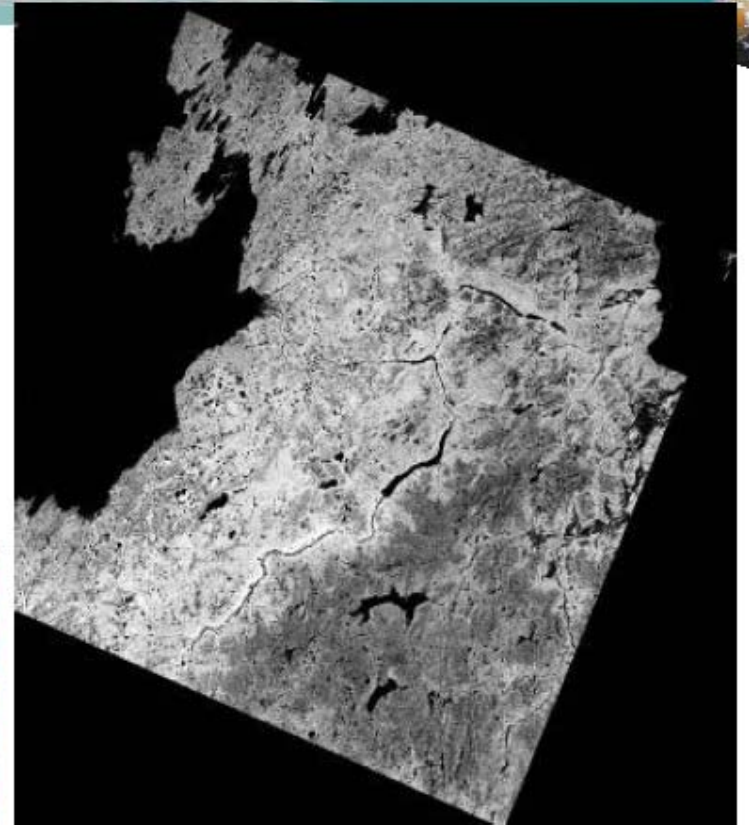
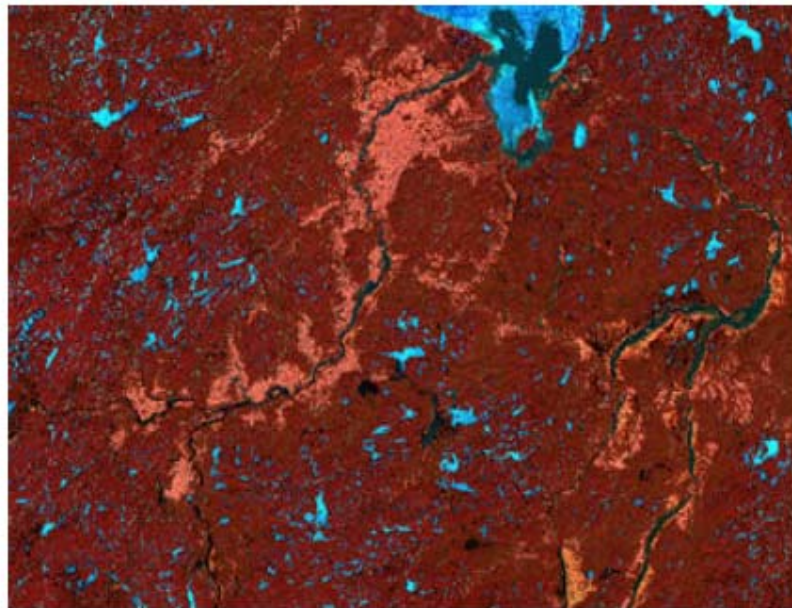
The mottled greytones visible in the lighter part are related to variations in moisture content of the soils (underlain by limestone)



the interpretation element: Tone/Hue

Greyscale or hue

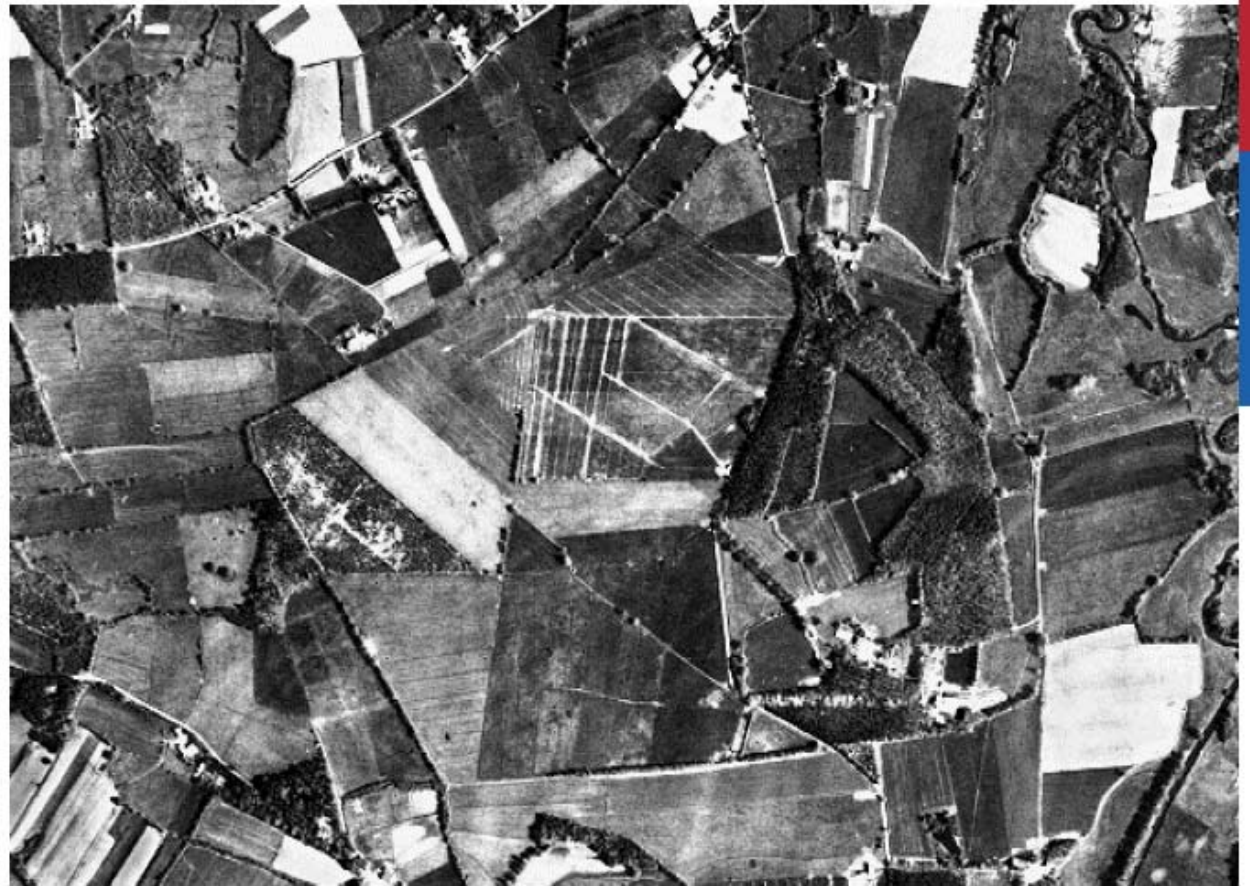
*Basic interpretation element also
allowing to appreciate the other
interpretation elements*



b) Size

The Size of objects must be considered in the context of the scale of a photograph or an image.

The scale will help one to determine if an object is a stock pond or a lake.



e) Shape



Shape -- refers to the general outline of objects.

- Many geomorphological shapes are diagnostic, like alluvial fans, sand dunes, ox-bow-lakes, volcanic cones, etc.
- Regular geometric shapes are usually indicators of human presence and use. Some objects can be identified almost solely on the basis of their shapes (The pentagon building in the USA).

SHAPE or FORM

The river (the Ebro in Spain) is spontaneous recognized by the characteristic form of the river channel, while the agriculture is defined by the geometric shape and size of the fields



d) Texture

Micro changes in density distribution

- The impression of “smoothness” or “roughness” of image features is caused by the frequency change of tone in photographs. Texture is dependent on scale.
- It is produced by a set of features too small to identify individually. Grass, cement and water generally appear “smooth”, while a forest canopy may appear “rough”.
- Granite in the Red Sea Hills of Sudan appear rough while the granites in the Fingoe Are, Tete Province, Mozambique might vary from rough to medium texture.

e) Pattern

Macro changes in density, resulting in a geometric configuration that repeats itself in space.

Pattern (spatial arrangement)

- **Pattern** refers to the spatial arrangement of visibly discernible objects.
- The patterns formed by objects in a photo can be diagnostic.
- Patterns can be formed by different object-elements, such as rock outcrops, drainage, streets, fields, soil type, etc.

The interpretation element **PATTERN**

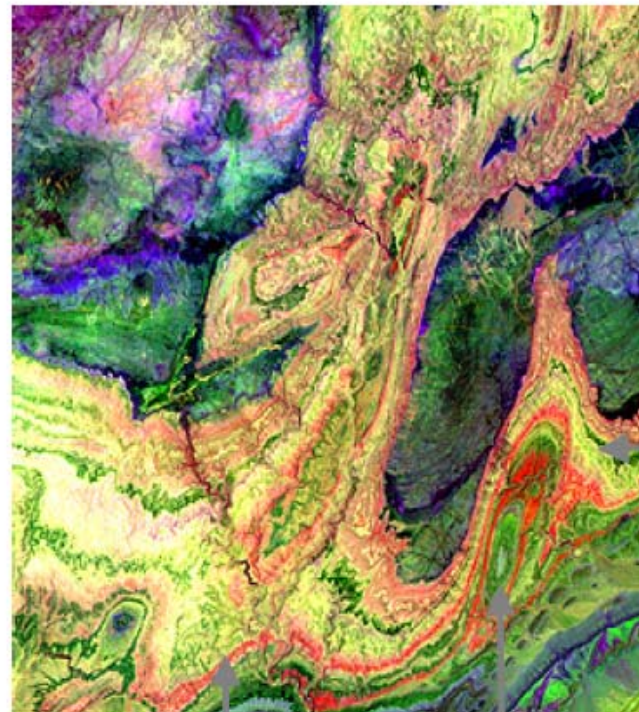
Pattern associated with faults and joints in the basement rocks of the Arabian shield. Faults show a generally larger continuity and they do not occur in a systematic pattern as is the case with joints.



Geologic Folds from Space



- A portion of the Anti-Atlas is imaged using three SWIR bands on Terra's ASTER.
- The folded structures stand out.
- The color composite shows various colors associated with rock units.
- This is another strong confirmation that IR and thermal remote sensing can distinguish and identify major rock types (where vegetation cover is sparse) with considerable validity.



Granite (dark blue)

Limestone (yellow)

Sandstone (orange)

Gypsum (green)

Use of Multiple Images in Image Interpretation

- Multi-band concepts and Images
 - VNIR, SWIR, TIR
- Multi date concept and imagery
 - Change detection (flood assessment, disaster evaluation, monitoring changes in coastal morphology)
- Multi-stage Concept and data
 - From generality to detail analysis
- Multi-disciplinary Analysis
 - The idea that 1 image can be looked by a variety of users.