

Digital Image Classification for Monitoring Landcover

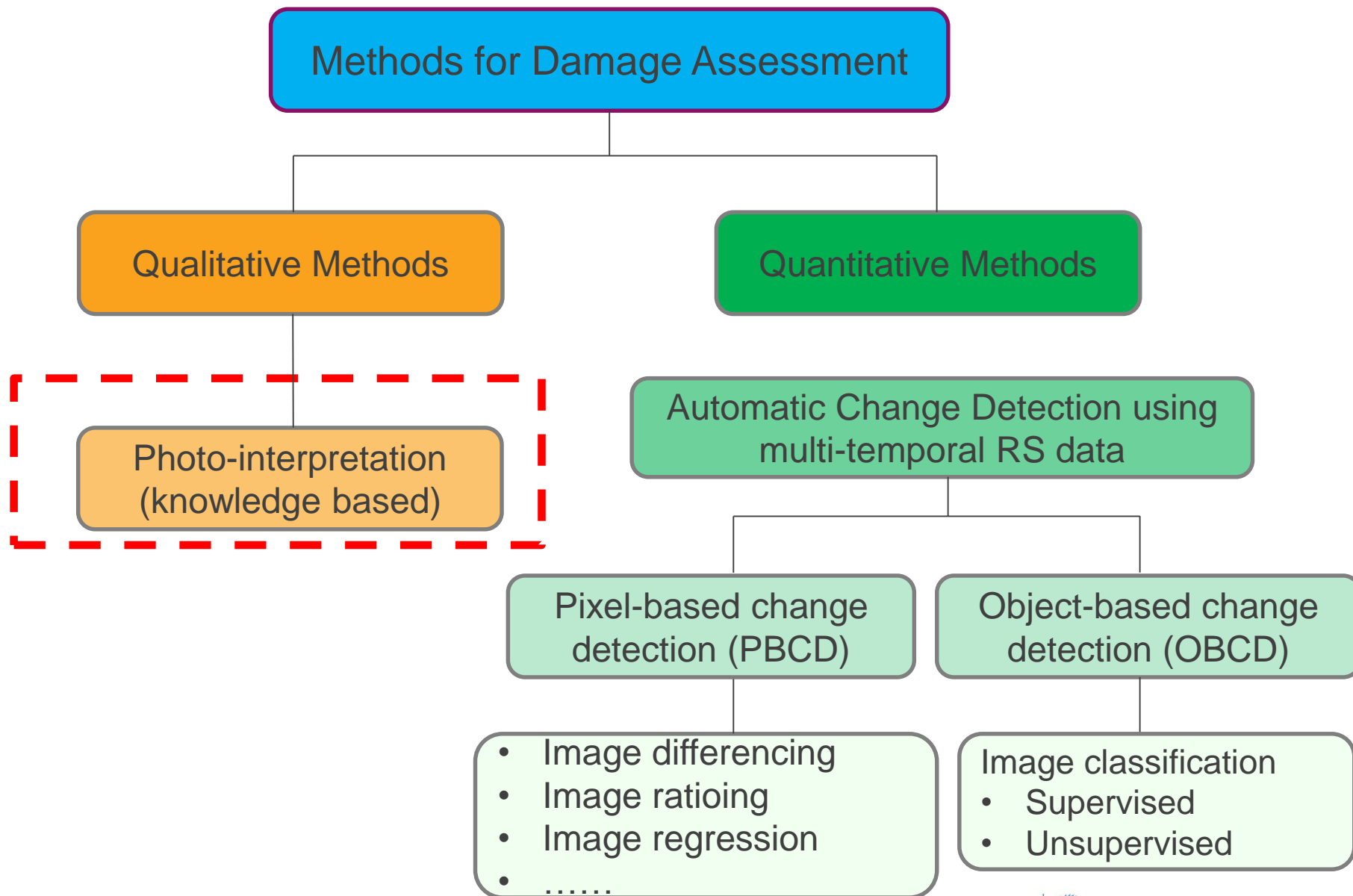
Trainer

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Training Module A1 Session 2

- What is change detection?
- Types of change detection analysis
- Advantages and limitations



- Definition of **Change Detection (CD)**: “the process of identifying differences in the state of an object or phenomenon by observing it at different times. (Singh, 1989)” .
 - The **RS data** has become a major source for change detection because of its high temporal frequency, digital format suitable for computation, and wider selection of spatial and spectral resolution.

The **principle** behind using RS data for CD is that changes in the object of interest will alter the **spectral behavior (reflectance value or local texture) that is separable from changes caused by other factors** (e.g. atmospheric conditions, illumination and viewing angles, and soil moistures).

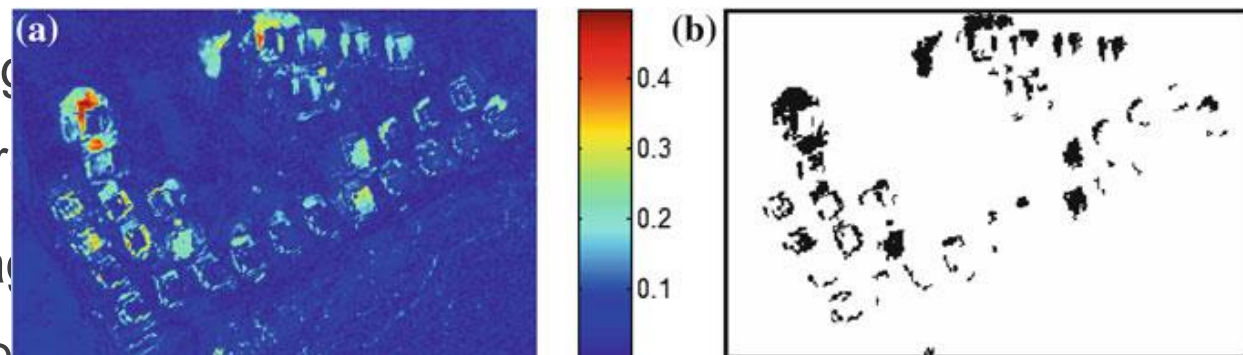


Image registration and multi-temporal radiometric corrections are the most important and indispensable steps in CD methods.

Precise geometric registration between multi-temporal images is essential to avoid largely spurious results, as image displacement will cause false change areas in the scene. **A sub-pixel level geometrical registration accuracy** is generally required by most of the CD studies.

- The most well-known pixel-based change detection methods
 - **Image differencing** : Spatially registered images acquired at different times are subtracted. A residual

Image differencing

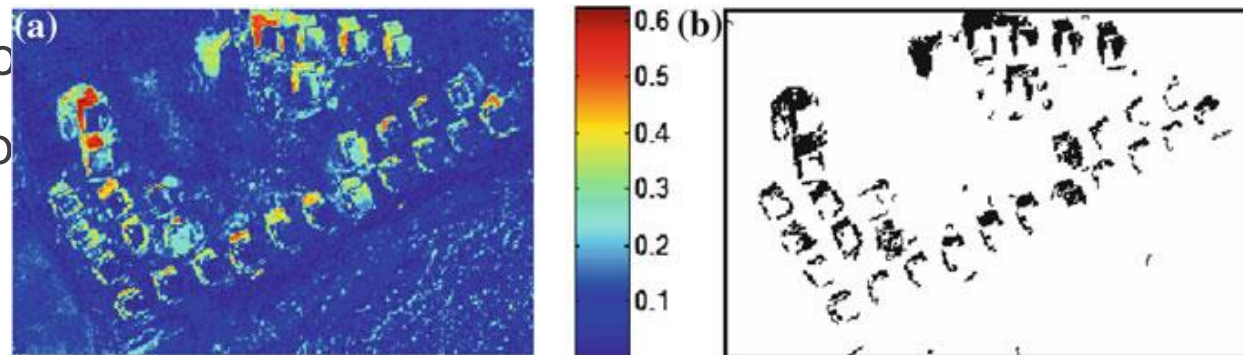


– **Image**

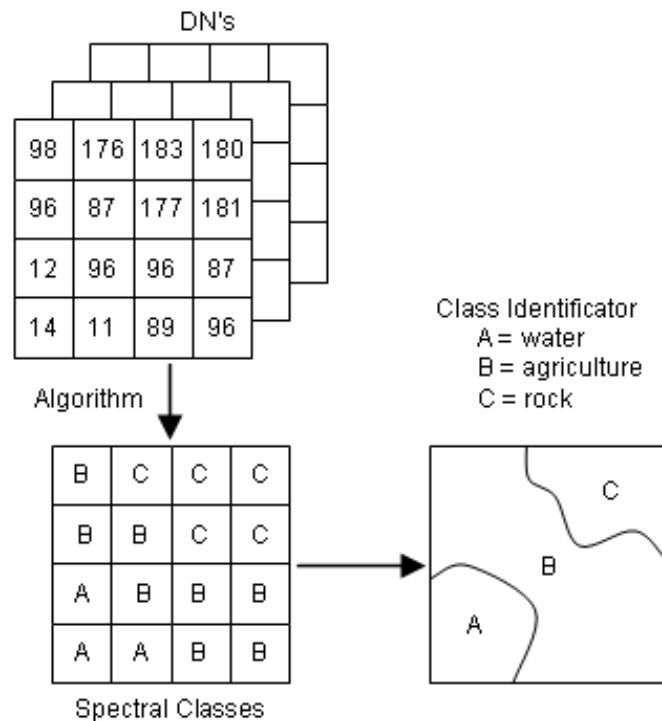
different dates with one or more spectral bands are

ratio

Image ratioing



Processing techniques which apply quantitative methods to the values in remotely sensed scene to group pixels with similar digital number values into feature classes or categories.



Classification-based change detection:

Bi-temporal images are first rectified and classified. The classified images are then compared to measure changes. **The classes for both the images have to be identical to enable one-to-one comparison.**

- How to detect change in Vegetation?
- How to detect change in landcover?



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