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Assignment-02
Remote Sensing
Parth Grang
and GIS

Useful bands for remote benzing:

- · regetation Bonds Bensitive to Chlorophyll content, Such as NIR and Red Edge bands (in the stange of 700-800 nm). are useful for studying vegetation health, type, and density. These bands are Sensitive to regetation vigor and can distinguish between healthy and Stressed regetation.
 - uxban Area uxban areas are characterized by different materials like Buildings, Troads, and Vegetation within a compact area. Bonds in the visible and near-intrared siegions (Such as Red and NIR bands) are helpful for distinguishing between these materials. Additionally, Shortware infrared (SWIR) bands can help in identifying man-made materials like concrete and asphalt.
- Water Area: Water bodies have unique 1 Spectral Signatures, especially in the SWIR segion. Bonds like Bond 11 (1.6 Um) and Bond 12 (2.2 um) in Landsat-8 and sentinel-2 are sensitive to water

absorption Jeatures, allowing John differentiation between land and water areas.

- 2) Procedure for Extending Roz and Sampling:
 - ROI Extraction Use Software like

 OGIS, Archis, or

 Specialized remote sensing software

 to delineate the region of interest

 (ROI) Using Shapefiles or polygons.

 This can be done manually by

 digitizing on automatically using

 Classification algorithms.
 - Sampling For land cover classification,

 Jephesentatives Samples Should be

 taken per cover type within the

 ROI. The number of Samples

 depends on the variability within

 each class and the desired accuracy

 level. Typically, 20 to 30 Samples

 per class are recommended to

 capture the Spectral variability

 accurately.

- 3 Pure pixel us Mixed pixel and Information Extraction:
 - ground cover type a within a pixel.

 For example, a pixel containing

 only regetation or only water.
 - Mixed Pixel A mixed pixel contains

 multiple cover types within a

 single pixel for example a

 pixel containing both vegetation

 and base soil.
 - Information Etraction I rom mixed pixel
 Objectival unmixing models like unear

 Spectival unmixing (LSU) or Multiple

 Endenember spectival mixture analysis

 (MESMA) can be used to estimate the

 proportions of different cover types within

 a mixed pixel. These models use

 Spectival signatures of known materials

 Cendmembers) to unmix the spectival

 Signature of a mixed pixel and

 determine the fractions of each

 endmember present.
- DEM VS. DIM.
 DEM (Digital elevation model)
 Represents the elevation of the Easth's

 Surface without considering any objects

 Like buildings or vegetation.

Pepresents the base Earth Surface without any objects like buildings.

trees, on other structures.

Method to Create DEM:

DEMs are often created using LiDAR

(Light Detection and Ranging) date or

by dealving elevation information from

Stereo Satellite imagery.

- (5) Minimizing Endors in GIS Date Collections-
 - -> use high-resolution imagery or L'DAR data for accurate Mapping.
 - Crucial to identify and correct.

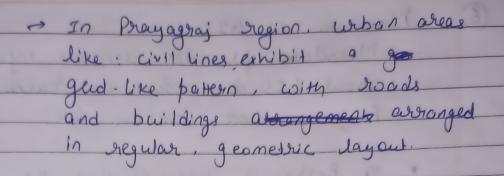
 errors:
 - data collection and processing to minimize errors
 - initially, leading to inaccurate analysis
 and decision-making.

- 6 Metadata in 425
 - essential Information about GIS data Such as Source, accuracy, Projection, and Creation date.
 - quality, olivitability, and reliability for objective applications
 - · Metadata Can be Collected during data acquisition, Processing, and storage stages using standardized Journals like ISO 19115.
- @ Elements of Nisyal inspection:
 - o Texture Texture rejers to Spatial arrangement and frequency of tonal variations within an image.
 - To Prayagraj region, whon areas exhibit

 rough texture due to presence of

 buildings, roads etc. Crass fields has

 almosth texture.
 - of Jeatures on ghound, which can be natural or human-made.



the composition and characteristics
of smage.

appears in Shades of blue, indicating water booker.

· Shape- The shape of feature can provide valuable information about their identity and characteristics.

-> In praygraj region; the Confluence
of Ganges and yamuna rivers
would create a distinctive Y Shape
HITA campus have rectongular shape.

between different Jeatures in an

The Prayagraj region, Presence of glass and temples along the banks of Gronges and Yamuna divers indicate their cultural and religious Significance.

TP and FN in a Confusion Mathix -

(8)

- · True Positive (TP) Instances Connectly classified as belonging to a specific class.
- · Talse Negative (FN) Instances of a class in correctly classified as another class.

Example conjusion Martix -For Four Classes A.B. C.D -

Λ	100 4000	Class	ClassB	Class C	Claus D
Actual	Predicted	Clays A			FN
ClassA		TP	FN	FN	FN
		FP	TP	FN	FN
Class B		FN	FP	TP	FN
Class C		FN	FN	FP	TP
Cli	0.38 D				

In this Confusion mathix -

- classified as A but misclassified B. C.D (FN)
- as B but misclassified as A. c. and D CFP)
- os C but mis classified as A, B, and D (FP)
- as D but mis classified as A, B and C (PP)