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Land Mass Area Of Dharwad District Using Erdas Imagine Tool

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Abstract: ***This project used to identify various landmasses region of Dharwad District, Karnataka State, India utilizing Remote Sensing (RS) information and spatial estimations. LANDSAT8 multispectral image of Dharwad district classified by means of supervised technique using ERDAS imagine tool where multispectral produces high resolution image using spatial spectral sharpening techniques. Three supervised classification methods used they are maximum likely hood, minimum distance and parallel piped. Result illustrate maximum likely hood performs better than minimum distance and parallel piped. Evaluation between maximum likely hood, minimum distance and parallel piped classified image measured using GPS device.***

Keywords: Remote Sensing, Urbanisation, supervised classification, Maximum likely hood classification, parallel piped classification.

I. INTRODUCTION

Satellite and digital imaging play an important role in remote sensing for providing information about the land surface. Satellite image contains data set from sensors or camera. These data produces electromagnetic spectrum which may be emitted or reflected depending on physical properties The recorded energy at different wavelengths track a sample which is the representative of the object and is known as the spectral signature of the object [1]. Multi-spectral resolution technique provides an powerful tool for high resolution image when image objects are generated. [2]. Two classification methods were used supervised and unsupervised classification. In supervised classification the training samples are provided for `identification of unknown pixel. Unsupervised classification is the identification of natural groups within multispectral data[3]. ERDAS imagine produces an good accuracy image for maximum likely hood using supervised classification method [4]

II. MATERIALS AND METHODS

A. MATERIALS

SOFTWARE TOOLS - ERDAS IMAGE TOOL ARK GIS
HARDWARE REQUIREMENTS Intel Pentium II or higher version is recommended, 1 GB RAM or higher version is required.**,** GPS: GARMIN Terex 30

B. METHODS

EARTH EXPLORER

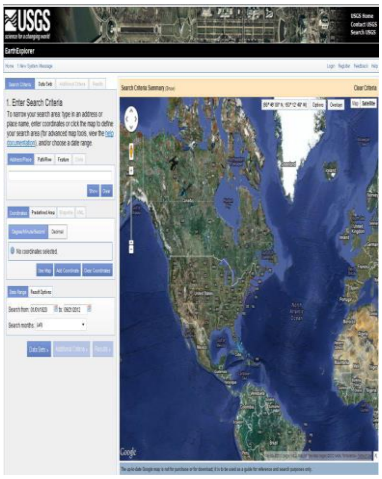

Figure 1: Earth Explorer

STEP 1: visit website in web browser

STEP 2: Entering the area of selection key in area of interest in the section place and adders after this it represents the coordinates and selecting the month, year and date

STEP 3: Selecting the data set from the LANDSAT archive and marking the LANDSAT 8

STEP 4: Selecting the proper data by applying radiometric, geometric correction

III. STUDY AREA

In this work, Dharwad District, Karnataka state was considered as the study area. The latitude (15.4575) and longitude (75.0061) .It covers up 191 km^2 Dharwad is to be found 425 KM from northwest of Bangalore.

LOCATION

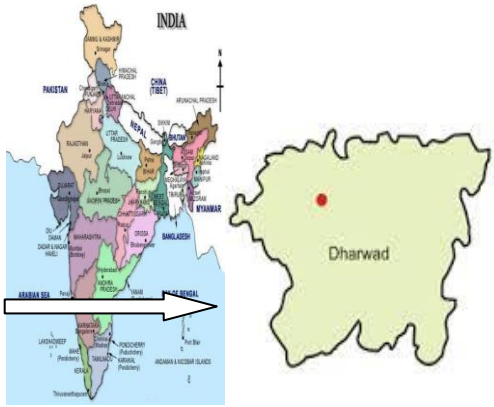

Figure 2: Shows the geographical location of Dharwad district

IV. METHODOLOGY

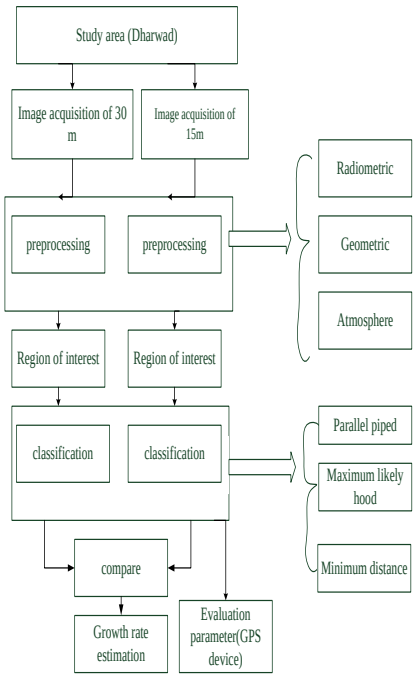

Figure 3: Project Flow

A. PREPROCESSING

There are three steps in image processing first one is Radiometric- Image contain radiometric errors these errors can be corrected using radiometric correction to avoid radiometric errors or distortions.

Second Geometric the error in image is caused between actual image coordinates and ideal image coordinates .This distortion are classified internal distortion effect from the geometry sensor and external distortion effected from of the object.

Third Atmospheric correction sensor will receive radiation not only from the directed reflected or emitted radiation in the atmosphere but also the scattered radiation which is called path radiance hence atmospheric correction is used to remove this effect.

B. REGION OF INTEREST (ROI)

Supervised classification- It represents the land cover features that analyst can recognize the area what is on the ground using training sets and digitize a polygon on that. The software system is used to develop a statistical characterization for each information class. This stage is often called signature analysis and may involve developing a characterization as simple as the mean on each band, or as complex as detailed analyses of the mean, variances and co variances over all bands.

Unsupervised classification- classification can be done without earlier information and by gathering pixel values dark levels of the pixels are examined .Then a threshold level is defined from receiving the quantity of classes in the picture. The better the threshold value will be represented with more number of classes.

C. CLASSIFICATION

There are three methods in classification one is Maximum likely hood classification, minimum distance and parallel piped classification. Parallel piped is a “centroid” for each class is determined from the data by calculating the mean value by band for each class. For each image pixel, the distance in n-dimensional distance to each of this centroid is calculated, and the closest centroid determines the class. Parallel distance and force are often used to detect outliers, especially in the development of linear regression models. A point that has a greater parallel distance from the rest of the sample population of points is said to have higher force since it has a greater influence on the slope or coefficients of the regression equation.

Maximum likelihood classification A pixel with the greatest probability is grouped into the relating class. The previously stated classifiers were construct fundamentally with respect to recognizing choice limits in probability choice guideline depends on likelihood. It allocates out every pixel having design estimations or components X to the classes.

Minimum distance the base separation to means choice tenet is computationally basic and ordinarily utilized. It can bring about arrangement precision practically identical to other all the more computationally escalated calculations, for

example, the most extreme probability calculation. Like the parallelepiped calculation, Minimum Distance to Mean Classifier requires that the user give the mean vectors to every class in every band ck from the preparation information.

D. EVALUATION PARAMETER (GPS DEVICE)

Efficiency is calculated from Maximum Likely hood, mimimum distance and parallel piped by comparing with actual points obtained by GPS device. GPS signature values of latitude and longitude are checked with the classified signature values. If the GPS device and classified image signatures are same then the accuracy will be 100%.considering 20 points for detection of accuracy between two images as showed in results.

V. RESULTS AND ANALYSIS

The Figure 3 shows a satellite raw image 30M of Dharwad district. The image taken by the Landsat 8 archive satellite sensor. Maximum Likely hood classification, minimum distance and parallel piped classification these three classifications are applied to the raw image. The output and change detection of each classification are shown below.

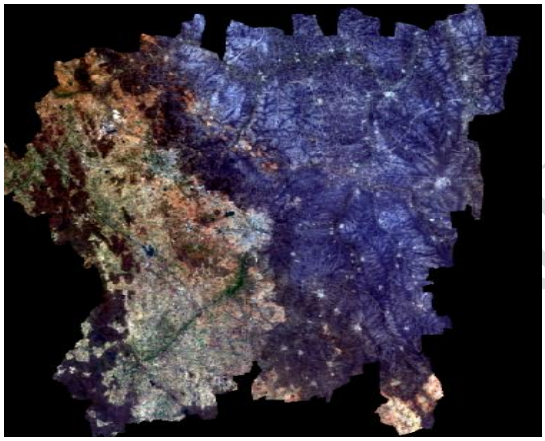

Figure 4: 30M Raw satellite image

A. PARALLEL PIPED CLASSIFICATION

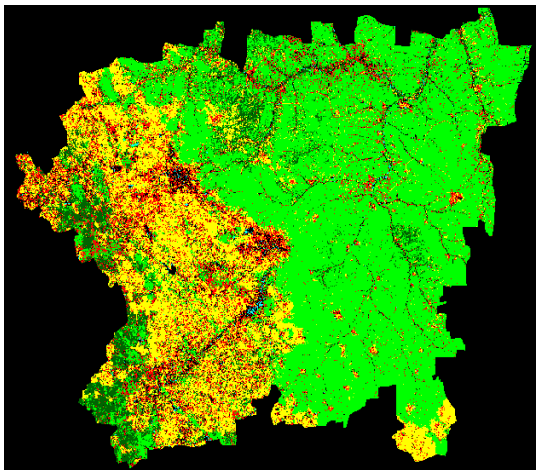

Figure5: 30M Parallel Piped Classified Satellite Image

Class	Color	(30m)
Aquatic weed		72.1456
Forest		273.57
water		443.0656
Build up		216.6
waste		367.57
Vegetation		1512.8

Table 1: Class names area in Square Kilometer

B. MAXIMUM LIKELY HOOD CLASSIFICATION

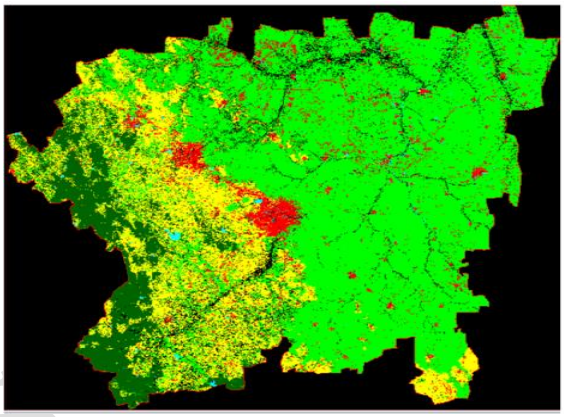

Figure 6: 30M Maximum likely hood Classified Satellite Image

Class	Color	(30m)
Aquatic weed		65.6703
Forest		272.590
water		524.14
Build up		225.23
waste		149.12
Vegetation		2210.00

Table 2: Class names area in Square Kilometer

C. MINIMUM DISTANCE CLASSIFICATION

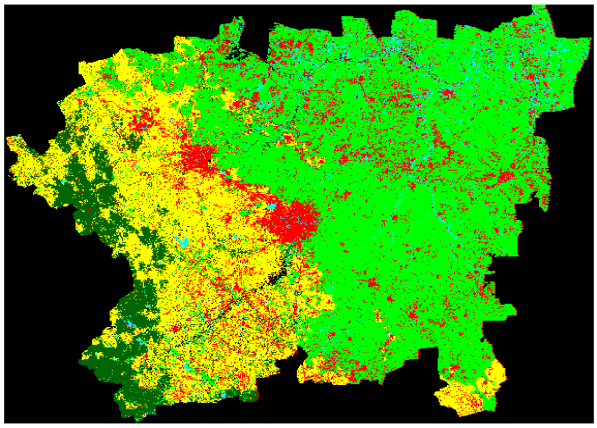

Figure 7: 30M Minimum distance Classified Satellite Image

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Class	Color	(30m)
Aquatic weed		72.1456
Forest		273.57
water		443.06
Build up		216.6
waste		367.57
Vegetation		1542.8

Table 3: Class names area in Square Kilometer

Class	30m
Maximum likely hood	90%
Parallel piped	80%
Minimum distance	85%

Table 4: Evaluation Parameter

From the table 3 we conclude that the best classification can be achieved by the method maximum Likely hood classification. Classification is shown in table 3. 15m produces an high accuracy image.

VI. CONCLUSION

This techniques would aid as decision-support tools for unraveling the impacts of classical urban sprawl patterns in Dharwad district.

VII. FUTURE WORK

By using resolution merge technique an high accuracy of image can be determined

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