

Digital park as it existed on september



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Digital Image Analysis of Yellowstone National Park Introduction Remote

sensing refers to the tele-observational surveying and mapping of physical, urban and environmental features. Remote Sensing is also a composite of many other subjects such as aerial photography, radar surveying, thermal surveying, weather forecasting and photogrammetry.

It has now become quite common practice to use remotely sensed data to take inventory, monitor and develop effective management practices of our natural resources. Objectively it is the purpose of this paper to further enhance the understanding of remotely sensed data in such a way that we may assist the human brain in the extraction and interpretation of this data through digital image analysis data manipulation techniques, such as rectification, enhancement and classification. The application of conventional and non-conventional image enhancement /classification procedures will be applied to an area of The Old Faithful section of the North Fork forest fire within Yellowstone National Park as it existed on September 8, 1988. They will also be applied to Nile Delta region of Egypt. Conventional technology in the context of this paper refers to imagery that is uni-dimensional, that is, it has only one spectral band available for analysis. The term non-conventional will refer to imagery that has multi bands available for manipulation and analysis.

Methods of enhancement utilized in the multi-band portion of this project include:- colour and histogram image enhancement- normalization and image algebra enhancement- filtering image enhancement- band transformations (eigen pictures) image enhancement- conventional methods of enhancement Methods of classification utilized in this project include:-

signature training (sampling)- supervised classification, PPD, Mindis, Maximumlikelihood- unsupervised classification, histogram equalization, clusteringMethods of enhancement used in uni-scene portion of this project include:- histogram equalization uni-band- filtering image enhancement Data AcquisitionData acquisition refers to the data by means of information gathering about the scale selection of the remote sensing formats and the target identification of the surveyed and mapped resources. In this analysis we have acquired Landsat Thematic Mapper data which consists of seven spectral bands and covers a 512×512 picture element area. The Landsat ground resolution or pixel size is 30×30 metres which translates to an area coverage of 235. 93 square kilometres of ground coverage, which is a subset region of the Yellowstone National Park. The Nile Delta region is located in northern Egypt and the data acquired was originally acquired for delta topography. The data is Landsat MSS with one available band and covers a 580×640 picture element area.

The Landsat MSS ground resolution is 80×80 metres which translates to an area coverage 2211. 84 square kilometres of ground coverage. In addition to the above mentioned sources of data, a supplemental map has been attached with the defined study area. Data ProcessingRefers to the process whereby one observes, classifies. and analysis specific targets or features found on the imagery and defines and explains the importance of those results. Data Application/UtilizationThe surveying and mapping of either environmental, physical, or human resources from aerial photographs or satellite imagery. The main purpose of data application is to make an

inventory, monitor, and make proper resource management plans for the future.

Conclusion A comparison of the conventional (single band) and unconventional (multi-band) enhancement and classification is necessary to complete this analysis of image enhancement and image classification in digital image analysis. It is quite obvious that the multi-band data set was more useful and flexible when it came to classification and enhancement. Many methods of enhancement were applied to the multi-band data and there were a lot of methods to choose from, depending on the type of features that were to be highlighted. That is not to say that the conventional methods of classification and enhancement are obsolete. It only means you must choose the best methods of enhancement to highlight a particular area in which you are interested.