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EXTRACT THE WATER BODIED FROM SATELLITE IMAGES

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Abstract: ***Basin is a region surrounded by terrain boundaries and precisely defined river basins. This is through-drying of the geographic area where the hydrological conditions exist, the basin, so that the water is concentrated in a specific place, for example the ocean, sea, lake or river or reservoir. Formation of topography, plants and ground, consisting of complex terrain boundaries or water gaps, complex sets of soil, and within catchments of land use. Terms of precipitation, watershed and basin are often considered synonymous. Remote sensing, defined as knowledge about the use of tools for measuring targets and their characteristics from remote locations without physical contact between the measuring instrument and the object to be unique. Typically, measurements are made by different techniques. These techniques are electromagnetic radiation (ultraviolet light, visible light, reflection, infrared heat, microwave, etc.). This paper describes various types of satellites and sensors used to acquire satellite images to extract water features. Several results were discussed. Finally, attempts have been made to complete current and future challenges relating to underwater extraction technology.***
Keyword: Water Bodied, Satellite Images, ERS SAR image, Gaussian fast transform (FGT)

I. INTRODUCTION

The meter records the radiation reflected or emitted from the target and interprets its characteristics from the measured signal. The possibility of taking measurements from a considerable distance easily meets the possibility of covering a wide area on the ground readily one of the advantages of remote sensing, (hundreds or thousands or even several kilometers for sensor satellites). In satellite equipment, it is also possible to monitor targets frequently. Sometimes, every day or several times a day. Classification is a subject widely studied in the treatment of remote sensing images. Common applications range from land use analysis to detection change. In the interest category, urban areas, farmlands, forests, river / lake areas are traditionally selected. Observation of the water body of the remote sensing image, it is particularly important in these recent years for two main reasons:

(1) To evaluate the current water resources and changes in the water resources for the world there is urgent need - because of the problems associated with increased water shortage;

(2) Has direct influence on so-called "climate change" and has been directly influenced after getting on jet ski;

(3) You can help with the development of water migration, using existing ones or setting up channels for direct or link long waterways development.

(4) Timely information is in mountains and mountains in the development of several strategies to limit flood disasters that increase water intake.

1.1 SATELLITES AND SENSORS APPLIED IN WATER BODY EXTRACTION

A number of Earth observation satellites orbit around our planet and provide repeating images of its surface. Many of these satellites can provide useful information for corrosion assessment, but they have not been used much for this purpose already. This section outlines the space flight probe used for water body extraction research. Sensors can be divided into visual and infrared spectra of electromagnetic spectrum and infrared thermal radiation (optical system), those that positively transmit microwave pulses and record received signals (imaging radars).

Table 1 summarizes sensor characteristics of the systems

Satellite	Sensors	Operation Time	Spatial resolution	# spectral bands	Spectral domain
Landsat-1,2,3	MSS	1972-1983	80m	4	VNIR
NOAA/ TIROS	AVHRR	1978-present	1001m	5	VNIR, SWIR, TIR
Nimbus-7	CZCS	1978-1986	825m	6	VNIR
Landsat-4,5	TM	1982-1999	30m 120m	6 1	VNIR, SWIR TIR
SPOT-1,2,3	HRV	1986-present	10m 20m	1 3	VNIR VNIR
IRS-1A,1B	LISS-1 LISS-2	1988--1999	72.5m 36.25m	4 4	VNIR VNIR
IRS-1C,1D	PAN LISS-3	1995-present	5.8m 23.5m 70m	1 3 1	VNIR VNIR SWIR
SPOT-4	HRVIR	1998-present	10m 20m	1 4	VIS VNIR, SWIR
IKONOS	Panchromatic Multispectral	1999-present	1m 4m	1 4	VNIR VNIR
Landsat-7	ETM	1999-present	15m 30m 60m	1 6 1	VNIR VNIR TIR
Terra	ASTER MODIS	1999-present 1999-present	15m 30m 90m 250m 500m 1000m	3 6 5 2 5 29	VNIR SWIR TIR VIS NIR SWIR/ MWIR LWIR
Quick Bird	Panchromatic Multispectral	2001-present	0.61m 4m	1 4	VNIR VNIR
SPOT-5	Panchromatic Multispectral	2002- present	5m 10 10m 20m	1 4	VNIR NIR SWIR
WorldView-1	Panchromatic	2007-present	0.55m	1	VIR NIR
GEOEYE-1	Pan-sharpened Panchromatic Multispectral	2008-present	0.41m 0.41m 1.65m	3 1 4	VIR NIR

Since Landsat contains the longest time series of the currently available satellite data, it remains in the most widely used satellite. The first satellite of the Landsat family is equipped with a multispectral scanner (MSS) and there are four bands with accuracy of 80 m.

II. OVERVIEW OF EXISTING METHODS

Feature extraction method

1) Entropy water-based extraction method was tested on images data. Figure 1 shows the extraction of water areas in the Bhopal Region. Figure 2 shows an example of the extraction process from the ERS SAR image on the Badi Lake. Due to the impact of spots in SAR images, the method works best for optical images compared to images. Details of water area boundaries are slightly smooth in the context of analysis of work results.

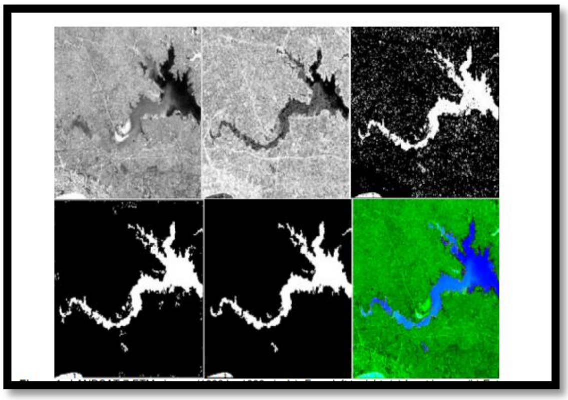
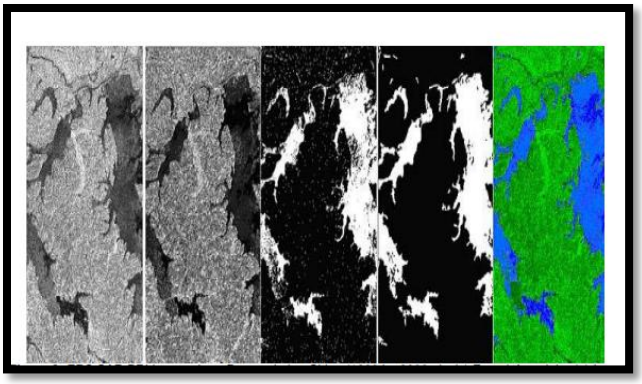


Figure 2 shows an example of the extraction process from the ERS SAR image on the lake of Bhopal.



In general, images include features such as color, texture, shape, edge, shadow, and time details. Promising features were colors, textures, and edges. These features are extracted individually from satellites and pools to obtain the extracted completed images.

The media shift algorithm is a powerful image segmentation technique. This algorithm moves frequently to the kernel core of each data point. The arithmetic complexity of the algorithm is an important barrier to the development of this algorithm

For practical use Gaussian fast transform (FGT) accelerated kernel density estimation of linear execution time of low dimensional problem. Unfortunately, the cost of extending FGT directly to high-dimensional problems is steadily increasing with dimensions, which is not practical for dimensions beyond fragmented images in the homogeneous region are obtained by mean transformed fragmentation. Subsequently, major water bodies identified as the first coastline were generated. The final coastline was obtained through local improvement within the boundary of the candidate zone adjacent to the first coast.

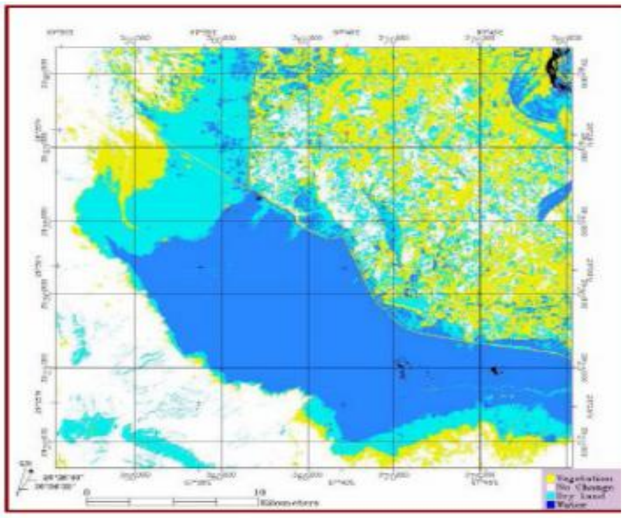
3) The skeleton is a process of peeling as many pixels as possible from the pattern without affecting the overall shape of the pattern.

4) In other words, after removing the pixels, the pattern must be recognized. The obtained skeleton needs the following characteristics.

As thin as possible;

Connection.focus

A water body feature extracted from a satellite image combining two processes. This process uses color image fragmentation algorithms, shell extraction algorithms, new skeleton extraction algorithms to extract color images and include structure boundaries.



Supervised and Unsupervised Classification method

Advances in sensor technology for earth observation made it possible to collect multispectral data at a much higher dimension. In addition, multi-source data also provides high-dimensional data. This high dimensional data can be classified into

(1) More layers can be classified;

(2) More energy is required to process this higher dimensional data; and

(3) Increase, processing time greatly increases

Remote sensing data is usually analyzed by machine-oriented pattern recognition techniques. One of the most commonly used pattern recognition techniques is probability-based classification (ML) assuming the distribution of Gauss layers. Gauss' taxation problem takes time to process. Long processing time leads to long computation time, resulting in cost increase. This computational cost can be a significant problem if the remote sensing data is analyzed over a large area or if the processing unit is more modest in its capacity.

1) The supervised classification of satellite image classification between 1992 and 2003 has been used in three different categories: blue water, green vegetation and dry land water.

The authors conclude that the neural network method uses a Landsat Theme Mapper Sensor (TM) image as a river Mississippi sensor in 1986. In this study, it extracted vectors (LVQ) for extracting automatic waters from the satellite image Landsat 4, suggesting that the target muzzle to determine the surface of the decisions between competing classes. They compared the findings of the tuft cap conversion (TCT) and the rule based on the traditional method. He pointed out that the result obtained by method LVQ is weak compared to rule based method and TCC, but the new road needs to be human while turning automatic way LVQ

3) Mysterious Gustavsson Kessel (GK) algorithm Bayes internal Bayes distance we controlled the algorithm using galaxy gas. The proposed algorithm uses a magical GK algorithm in the extended FCM model. The distribution and size of the group is usually the result less than the standard of FCM. To adapt to different structures in the data, we use the GK algorithm covariance matrix to capture the elliptical mass properties. Classify satellite images of remote sensing using possible multidimensional data. In ambiguous algorithms, implementations are generally repeated, so there are few changes to membership values

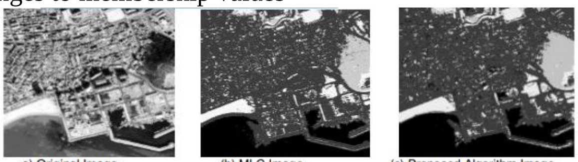
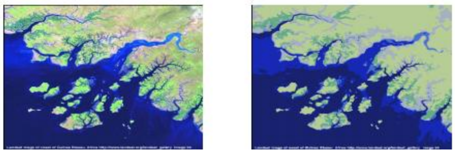

a) Original Image (b) MLC Image (c) Proposed Algorithm Image

Figure 9: Classification result images of maximum likelihood algorithm (MLC) and proposed algorithm using IKONOS satellite image.



Feature Based Classifier

The process of classifying water types by defining category boundaries and applying statistical decision criteria to assign pixels to specific categories. We implemented two workbooks based on the Euclidean Space Classifier and the Eigenvector classifier. The Euclidean classifier assigns each pj-pixel to water type i based on the distance between the pixel and the midpoint or average of each chapter.

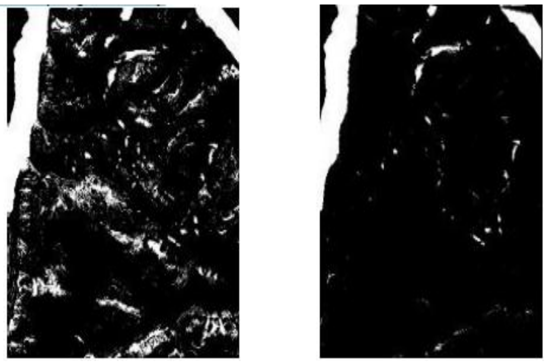
Data Fusion

1) After extracting features, two methods of detecting change are applied:

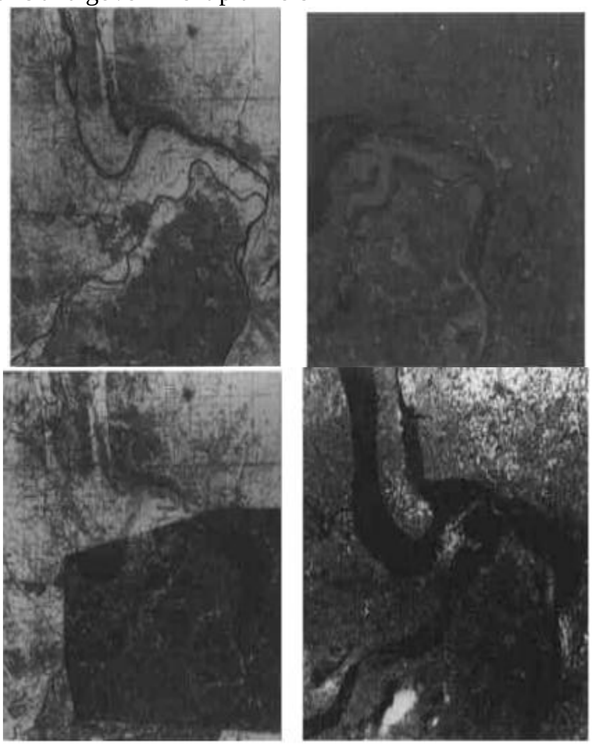
a) Based on picture from picture and

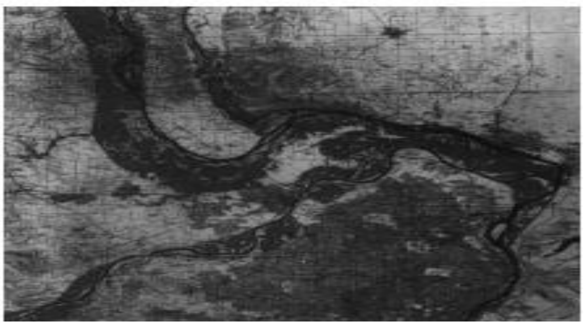
b) Features. In the image-to-image approach, you can distinguish between multiple grading images between the two approaches.

Indirectly detects changes in images. The change analysis follows the image classification process. The comparison can be done by two thematic layers or by extracting the boundaries of the subject area and performing change analysis (i.e., based on the features). This approach overcomes problems associated with image acquisition conditions such as different sensors, atmospheric conditions, lighting, and display geometry. The accuracy of the detected change is proportional to the accuracy of the ortho image correction and the result of the classification. In the second method, the images were formatted and used for the main analysis of different images, image regression and elements. In the feature-based approach, the feature-based approach uses a variety of spatial analysis features such as union layers, layer intersections, buffer creation, and topological overlay



We evaluated various satellite imagery of the flood in the St. Louis area in 1993 and integrated it into the data set in a timely manner. The resulting maps show that various users can identify both nature and artificial features, accurately and quantitatively quantify the flood volume, determine flood characteristics and flood dynamics, and easily convey the results to a broad audience It was worth it. In addition, to track changes over time, identify the nature of the flood, identify failures / weaknesses in the flood control system, provide input to future flood analysis plans, and report clean flood details You can continue the map of. Work with both public and government planners





The proposed the Dragon algorithm. This is an integrated method based on image processing and hydrological modeling. Hydrological modeling methodology based on DTED flow modeling site (Digital elevation data elevation). Satellite images are used to provide direct evidence of flow position and lake and to compensate for flow position derived from DTED [45]

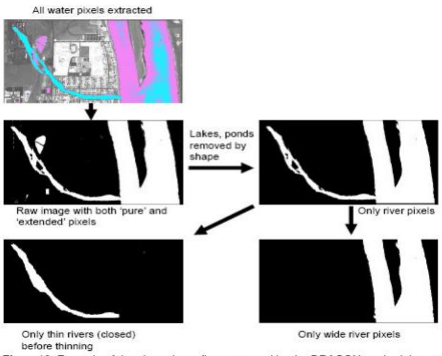


Figure18: Example of the piecewise refinement used by the DRAGON methodology to extract narrow (< 30m wide) and wide rivers

III. CHALLENGES, CONCLUSIONS, AND THE FUTURE

The distinction between the color of the tall building's shadow and the color of the calm water surface is still a challenge for experts. Therefore, it is difficult to obtain accurate information on urban waters. For urban trace water, other similarity tests shall be carried out. Many algorithms have been developed to extract the body of water, but none of them are universally accepted. This does not apply to different sensor images. Most are application specific. In the future, the water body extraction algorithm will be optimized; the system for processing all kinds of sensor images will be automated and will be combined with other tools to provide better information for flood and groundwater use. These aspects are very important issues in developing countries. In some cases, it is tedious to collect land-based data manually. Conclusion: In the first part of this paper, the importance of water body information, motivation to extract water features, and great difficulty of fragmentation of the water body.

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