

A Review on Use of GIS Application for Creek Water Analysis

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Abstract

Water is the basic element of social and economic physical system and is essential for healthy social and sustainable development. The use of remote sensing and geographical information system in water and waste water streams monitoring and management. Geographical information system used to present the spatial distribution of the parameters and raster maps created. Application of this type of GIS based software promotes sustainable management of water resources. The review shows the analytical results concentration of parameters like biological oxygen demand (BOD), chemical oxygen demand (COD), hardness, electrical conductivity, total dissolved solid.

Keyword- Creek Water Parameters, Water Quality Management, GIS Software

I. INTRODUCTION

When something is added to the environment that makes it unclean or unsafe it is called pollution. In water there are many things are added in to this some are dead and some are alive which make water unfit to drink for nearby area. Many type and sources of water pollution: sewage and domestic waste, heavy metals, industrial water pollution, pesticides, fertilizers etc. most of the creek water done by domestic water pollution done nearby area and also if there are any industrial activity has been done then there discharge effluents which cause. Urban run-off is the water running from our yards, streets, and buildings every day that carries pesticides, heavy metals, and other chemicals into our waterways. Because of that the river water quality monitoring program are needed in order to raise awareness of public by address the consequences of present and future threats of contamination to water resources.

A. Geographic Information System

Various studies have been reported on the usefulness of remote sensing as tools in monitoring of water quality. GIS as a structure constituted by a powerful of instrument constituted by a powerful set of instruments and technologies committed to acquire, store, manage, transform, analyze and visualize geo-referenced spatial data.

Components of geographical information system:

- Data (geographic information model and structures)
- Organizational structure and work methods
- Software components
- Hardware components

GIS has been used in the map classification of water quality, based on correlating total dissolved solids (TDS) values with some aquifer characteristics or land use and land cover. Other studies have used GIS as a database system in order to prepare maps of water quality according to concentration values of different chemical constituents.

II. METHODS

A. Conventional Data Base

- Layout map
- Water quality parameters

B. Instruments used

- Gps
- Water quality field kit

C. Mostly used software

- Arc gis
- Ilwis

D. Creation of Database

A collection of information in such a way that a computer program can quickly select desired pieces of data. Traditional database is organized by field, records and fields. A field is a single piece of information a record is one complete that of fields and a file is a collection of records. Here data base was created using ground water quality parameters.

E. Scanning of Toposheets

Scanning results in the conversion of the image into an array of pixels thereby producing an image in raster format. A raster file is an image created by a series of dots called “Pixels” that are arranged in rows and columns. A scanner captures the image by assigning a row in a column and a colour value each dot.

F. Digitization

A Raster image is a type of computerized image that consists of row after row of pixels. There are many different raster image file format. Digitization is the process which converts raster to vector format. Most of the GIS technologies are vector formats are more common, so the raster format is converted into a vector format.

G. Query Analysis

Data query retrieves a data subset from a map by working with its attribute data. The selected data subset may be visually inspected or saved for further processing.

The water quality parameters were tested in the laboratory. The Lab Test Procedure was done as per Indian standard code of Practice. The water quality parameters are given in the data base to GIS.

H. Analysis

Major water quality Parameters analysed:

- pH
- TDS (Total Dissolved Solids)
- COD (Chemical Oxygen Demand)
- BOD (Biochemical Oxygen Demand)
- Total Hardness
- Electrical Conductivity (EC)

Norsaliza Usali & Mohd Hasmadi Ismail et.al (2010) has studied that the application of remote sensing and GIS specifically in monitoring water quality parameter such as suspended matter, turbidity, and dissolved organic matter. In fact the capability of this technology offers great tools of how the water quality monitoring and managing. They conclude that remote sensing and GIS technologies coupled with computer modelling are useful tools in providing a solution for future water resources planning and management to government especially in formulating policy related to water quality. Rajkumar V. Raikar, Sneha, M. K et.al (2012) has studied that water quality analysis carried out at the Bhadravathi Taluk, Karnataka, India. Twelve physico-chemical parameters were considered in the analysis. Geographic information system (GIS) is used to represent the spatial distribution of the parameters and raster maps were created. maps showing the spatial distribution of various physico-chemical parameters are developed using GIS facilitated in identifying the potential zones of drinking water quality. Water Quality Index (WQI) shows a wide variation among all the water samples. P. Balakrishnan, Abdul Saleem and N. D. Mallikarjun et.al (2011) has studied that spatial variations in ground water quality in the corporation area of Gulbarga City located in the northern part of Karnataka State, India, have been studied using geographic information system (GIS) technique. The water samples were analyzed for physico-chemical parameters like TDS, TH, Cl⁻ and NO³⁻, using standard techniques in the laboratory and compared with the standards. They identified Quantifying the domestic sewage that enters into the different water bodies located in the city, will help in planning for effective sewage treatment plant and minimizing groundwater pollution by sewage. Also find that of groundwater recharging locations and structures. Continuous monitoring of groundwater table level along with quality study will minimize the chances of further deterioration. T. Subramani, S. Krishnan P., K. Kumaresan et.al (2012) has studied that surface water and ground water level is decreasing, pollution and increased demand have made good quality water scarer and more expensive. Hence monitoring of ground water quality has become indispensable. GIS not only facilitates data capture and processing but also serve as powerful computational tools that facilitate multimap integrations. In this project ground water quality analysis was carried out for Coonor Taluk in Nilgiris District water samples were collected all around the taluk the strategically analysed results are presented in a GIS based water quality mapping. GIS technologies can provide appropriate platform for convergent analysis of large volume of multi-disciplinary data and decision making for ground water studies can be effectively done. The GIS bare zoning of groundwater quality map may be used as a guideline for predicting the groundwater quality to new areas. V. Hema Sailaja, M. Anji Reddy et.al (2015) has studied that tool of complex water quality data, informing managers about the overall water quality status of Hussain sagar lake of Hyderabad District, Telangana, India by providing the spatio- temporal changes. Mapping was done using satellite data & GIS combined with GCP measurement. Using satellite data and in situ measurement data of water quality parameters,

correlation were developed through geo-statistical analysis. After study done in study find that The water quality data have been examined by different multivariate statistical techniques and is used to evaluate spatial and temporal variations of the lake basin. Result of water quality assessment that most of the water quality parameters slightly higher in the wet season than in the dry season.

III. CONCLUSION

The summary of review carried out monitoring and management of water bodies. Concentration of parameters like COD, BOD, pH, hardness, EC were analysed and create maps using GIS software. GIS technologies can provide appropriate platform for convergent analysis of large volume of multi-disciplinary data and decision making for ground water studies can be effectively done. The GIS bare zoning of water quality map may be used as a guideline for predicting the water quality to new areas.

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