### Efficient Water Quality Analysis using Machine learning

LITERATURE SURVEY

# TITLE: A Novel Spatiotemporal Data Model for River Water Quality Visualization and Analysis

**AUTHOR:** Yinguo Qiu , Hui Xie

**YEAR:** 2019

# ABSTRACT:

River water quality (RWQ) data has obvious characteristics of spatial and temporal distribution, and tables are conventionally exploited for storage of multi-period monitoring data of RWQ; however, neither effective visualization nor accurate analysis of the obtained data can be realized due to its dispersion character. In this paper, a novel spatiotemporal data model is proposed for RWQ data to realize conveniently data representation and spatiotemporal analysis. In this model, a spatial point, containing both location and dynamic water quality information, is considered as the basic element of river spaces, and methods of expanding a point to a line segment, a flat surface and a cube are designed respectively so as to make this model be applicable to different generalizations of river spaces. Moreover, a temporal data storage structure is designed so that efficient inquiry and advanced analysis of RWQ data can be guaranteed and the occupied memory space can be reduced. Finally, case studies are conducted by performing 3D visualization, trend analysis and anomaly identification on RWQ data, the result of which showing that tridimensional representation of RWQ data can be realized efficiently, the computational complexity is reduced significantly and the occupied memory space of monitoring data is effectively economized..

# TITLE: Performance of Artificial Intelligence Models in Analysis and Prediction of Water Potability

**AUTHOR:** Noha E.Attar,Hesham R.Lotfy

**YEAR:** 2022

# ABSTRACT:

Water is a prime necessity for the survival and sustenance of all living beings. Thus, it is very important to maintain a water quality balance. Otherwise, it would seriously damage the health of humans and severely affect the ecological balance among other species. Water quality is an important factor to consider, whether for ecosystem needs or contamination levels that directly impact health, hygiene, food, and the economy. In this study, we have utilized Artificial Intelligence as an efficient technique to predict water quality without resorting to the traditional analysis methods of water monitoring. We have developed a convolutional neural network as a deep learning algorithm and applied five kinds of machine learning algorithms: Backpropagation Neural Network, Random Forest, Decision Jungle, Naive Bayes, Logistic Regression, and Support Vector Machine. The reported results of the classification process showed that the CNN has superior to the other machine learning algorithms in predicting the water potability based on the eight adopted parameters of water properties. CNN has achieved nearly 97% accuracy in the prediction process, while RF, the best one in the utilized machine learning algorithms, has recorded 81%. In addition, CNN has also proven its capability to reduce classification processing time.

**TITLE:** Analysis of water quality of river

**AUTHOR:** Pawan Kumar Singh and Pradeep Shrivastava

**YEAR:** 2015

# ABSTRACT:

Water quality analysis is one of the most important aspects in surface water studies. Assessment of water quality is a critical factor for assessing the pollution level. Water sample were collected from 12 disfferent sampling stations for evaluate the water quality status of river Narmada during September-2010. A total 16 water quality parameters were analyzed. During the present investigation the minimum and maximum value of air temperature, water temperature, turbidity, pH, electrical conductivity, total dissolved solids, free carbon dioxide, total alkalinity, chloride, total hardness, Calcium Hardness dissolved oxygen, nitrate, orthophosphate, biochemical oxygen demand, chemical oxygen demand were noted as 25 and 31.3 °C; 22.4 and 29 °C ; 8.6 and 40.2 NTU; 7.63 and 8.76; 230 and 398 μs/cm; 146 and 274 mg/l; 4 and 22.4 mg/l; 112 and 226 mg/l; 12.38 and 44.56 mg/l; 104 and 212 mg/l; 63.84 and 118.44 mg/l; 4.16 and 8.8 mg/l; 0.542 and 4.824 mg/l; 0.112 and 0.546 mg/l; 4.16 and 19.2 mg/l; 10.4 and 46 mg/l respectively. The objective of present study was to understand the water quality of river Narmada at Hoshangabad District. (M.P).

# TITLE: Evaluating Drinking Water Quality Using Water Quality Parameters and Esthetic Attributes

**AUTHOR:** Meseret B Addisie

**YEAR:** 2022

# ABSTRACT:

This study assesses the quality of drinking water sources in the highlands of Ethiopia. The study considered a combination of users’ perceptions with the measured water quality parameters determined using the water quality index (WQI) tool. Data were collected using a cross-sectional research design for a household survey, and water quality samples were collected from improved and unimproved alternative sources. Nine physicochemical and two bacteriological analyses were performed. The result shows that esthetic water quality parameters had a potential interpretation of water quality as of the laboratory analysis. The taste was the dominant and easily detectable indicator as compared to odor and color. This is associated with the higher correlation between iron and manganese that deter the taste of water. Tap water was the only free source of bacteriological contamination. The WQI values show that one improved and three unimproved sources were found in the rank of unsuitable for drinking purposes. Unimproved sources are harmful for drinking, although they are used as an alternative source of water. Finally, the study suggests that due consideration of esthetic factors as measured parameters is fundamental for the sustainable use of drinking water infrastructure

# TITLE: Water quality analysis of River Yamuna using water quality index in the national capital territory, India.

**AUTHOR:** Deepshikha sharma & Arun Kansai

**YEAR:** 2011

**ABSTRACT:**

River Yamuna, in the national capital territory (NCT), commonly called Delhi (India), has been subjected to immense degradation and pollution due to the huge amount of domestic wastewater entering the river. Despite the persistent efforts in the form of the Yamuna Action Plan phase I and II (YAP) (since 1993 to date), the river quality in NCT has not improved. The restoration of river water quality has been a major challenge to the environmental managers. In the present paper, water quality index (WQI) was estimated for the River Yamuna within the NCT to study the aftereffects of the projects implemented during YAP I and II. The study was directed toward the use of WQI to describe the level of pollution in the river for a period of 10 years (2000–2009). The study also identifies the critical pollutants affecting the river water quality during its course through the city. The indices have been computed for pre-monsoon, monsoon and post-monsoon season at four locations, namely Palla, ODRB, Nizamuddin and Okhla in the river. It was found that the water quality ranged from good to marginal category at Palla and fell under poor category at all other locations. BOD, DO, total and fecal coliforms and free ammonia were found to be critical parameters for the stretch.