

## **PREFACE**

Water quality monitoring is a crucial aspect of managing water resources. Chlorophyll-a is an essential indicator of water quality as it indicates the presence of phytoplankton, which is the basis of the aquatic food chain due to their capacity to cover wide regions and produce useful data, remote sensing (RS) and geographic information system (GIS) techniques have become more and more popular in the monitoring of water quality. This report presents the use of Google Earth Engine and Geoinformatics to map chlorophyll-a concentrations in the Brahmaputra River Basin.

This topic highlights the utilization of Google Earth Engine (GEE) for real-time mapping of chlorophyll-a concentrations in the Brahmaputra River. Chlorophyll-a serves as a proxy for phytoplankton biomass and abundance, making it a crucial indicator of water quality and ecosystem health in coastal and estuary environments.

Through the power of GEE, which provides access to vast amounts of satellite imagery and computational resources, it becomes possible to analyze and monitor chlorophyll-a dynamics in near-real-time. This enables researchers, scientists, and environmental agencies to gain valuable insights into the spatial and temporal variations of chlorophyll-a concentrations, facilitating informed decision-making and effective management strategies.

By leveraging the capabilities of GEE, this study demonstrates the feasibility of real-time mapping of chlorophyll-a in the Brahmaputra River. The combination of remote sensing data, algorithmic processing, and statistical analysis techniques provides a comprehensive and efficient approach to monitor and assess the health of aquatic ecosystems.

The findings and methodologies presented in this study aim to contribute to a better understanding of the factors influencing chlorophyll-a dynamics in the Brahmaputra River and provide valuable insights for the sustainable management and conservation of this important water body.