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NOVEL CONCEPT FOR REMOTE SENSING OF COASTAL WATER BODIES USING SUBMERGED
ACTIVE SOURCES OF ELECTROMAGNETIC RADIATION**Abstract**

Poor quality of water and harmful algae blooms are problematic in the Central American region since their derived consequences can generate economic losses, due to its effects in tourism and fishing activities characteristic of the zone. In addition, these problematics have a direct impact on the health of marine ecosystems and people, as harmful algae blooms can be affected by the quality of water on the coasts, as well as by the amount and type of sediment discharged by rivers. The objective is to conduct a feasibility study of the analysis of bodies of water on the Costa Rican coast using a method based on submerged electromagnetic radiation sources, signals would be received by an instrument in orbit. This method would seek to determine water quality, including harmful algal blooms defined as a biological event composed of micro-algae species that is maintained over time and space and results in significant changes in radiation absorption. The model uses a submerged transmitter at a depth to be determined, which begins to generate electromagnetic radiation, the emitter parameters could vary during the mission, also the signal will emit when the satellite is in sight. By taking into account the parameters set on the emitters and comparing them to the parameters of the signals received by the instrument, the characteristics of the water surrounding the submerged emitter, can be inferred in conjunction with a database and previous calibration. In order to determine the characteristics of the electromagnetic waves and depth of emission to be used, monthly samples are currently being taken in the area of the Gulf of Nicoya, Costa Rica. These samples are analysed in order to study their behaviour related to electromagnetic radiation and composition using equipment such as spectrometers, among others. So, in this way, a database is being constructed with information that allows to analyse the parameters of the samples to extrapolate them to the characteristics of the electromagnetic waves to be emitted in such a way that the behaviour observed by the satellite allows to obtain conclusions regarding the quality of water and the presence of chlorophyll and phytoplankton that may indicate a possible algal bloom. The viability of the proposed system will be determined by analysing the results of the samples that are being taken, in order to design a working method for its possible implementation in the first satellite built by the University of Costa Rica.