Autonomous Water Monitoring System

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With 78% of US coastal waters polluted with algal blooms, agricultural and industrial nutrient run-off, including high levels of phosphorus and nitrogen, is severely impacting aquatic ecosystems and consequently the economy, costing the US tourism industry $1 billion per year. The Autonomous Water Monitoring System is cost effective and versatile, measuring specified aspects of water quality to identify effects of nearby run-off as the first step to instigating beneficial change. Using colour-based reagents, the system quantifies the concentration of a wide variety of substances in water. Using C++ programming, the required amount of water and reagent are measured and combined, initiating a colour change to be measured by RGB sensors, indicating the concentration as per testing kit colour charts. The system then sends this data to another device through Bluetooth, providing a more autonomous approach. The Autonomous Water Monitoring System identifies specific causes of pollution such as algal blooms, and hence the implementation of more sustainable and effective solutions. As current solutions are highly expensive and often have data transferral connection needs unsuitable for more remote areas, the system prototype provides a more cost effective and versatile approach to monitoring waterways. The system can act as an incentive for organisations to take action to reduce their environmental impacts and encourages monitoring to indicate their direct effects on the environment around them. Furthermore, it can also be used in a wide variety of situations, from household environments including aquariums and pools, to more industrial applications such as aquaponics and farming.

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