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Drones: Application of novel technologies to increase efficiency of water sampling methodologies

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Drones have recently emerged as a novel technology potentially capable of collecting in-situ hydro-chemical data and water samples from aquatic environments. Advancing the use of drones as a water sampling methodology is highly desirable as they can potentially increase water sampling efficiency and reduce personnel safety and biosecurity risks. This research aimed to assess the potential of drones to take water samples and physico-chemical data from lakes. A payload capable of successfully collecting 2 litres of water and real-time physio-chemical data was deployed using a DJI Matrice 600 Pro drone. Comparison of water chemistry parameters from samples collected using a boat and the drone found no statistical difference between the two sampling methods. In addition, cost benefit analysis indicates that the drone can collect samples 2.7 times more efficiently than the boat. These results successfully demonstrate the applicability of drones to collect water samples and real-time physico-chemical data from aquatic systems.