Title: Top gun: aerial drones for mapping wetland vegetation

Principal Supervisor: Dr Peter Macreadie

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Start date: January 2015

Project description: Unmanned aerial vehicles – commonly referred to as 'drones' – are revolutionising conservation projects around the world. Compared with traditional remote sensing technologies, such as satellite and airborne sensors, drones are significantly cheaper and much more accessible. In coastal environments, however, the performance and approaches for using drones to map vegetated habitat has not yet been validated. This project will for the first time investigate the use of drones (VUAS-X5) for mapping seagrass, saltmarsh, and mangrove habitat. The study site for this work will be the north-east corner of Western Port Bay, which is currently facing significant losses of coastal vegetated habitat (>0.5 m of shoreline per year) due to erosional forces. This project will produce geo-referenced and ground-truthed land use/cover maps for the region, which will help guide conservation and restoration efforts as part of a broader 'green infrastructure' program. The successful student will ideally be experienced in using GIS and needs to be comfortable working in the field (drivers licence required). The student will work as part of a team involving two PhD students, a research assistant, and members of the Western Port Seagrass Partnership. Good interpersonal skills are essential; the successful student will need to liaise with local farmers.

Title: Carbon sequestration by lakes: A fresh(water) approach to tackling climate change

Principal Supervisor: Dr Peter Macreadie and Dr Rebecca Lester

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Associate or External Supervisors and their contact details: Students wishing to be based at Burwood with have Dr Macreadie as the Principal Supervisor with Dr Lester as the Associate Supervisor, and vice versa for students wishing to be based at Warrnambool.

Start date: January 2015

Project description: Biosequestration is regarded as one of the single largest opportunities for CO_2 emission reduction in Australia. The focus has so far been on terrestrial ecosystems (e.g. existing carbon farming initiative), yet recent data indicates that freshwater ecosystems have much higher (~50-times) carbon burial efficiencies than powerful terrestrial carbon sequestering ecosystems such as rainforests. However, the carbon sink capacity of Australian freshwater ecosystems is largely unknown. This study aims to fill this knowledge gap by measuring carbon stocks and carbon accumulation rates of freshwater lakes throughout Victoria. The project will involve a 'road trip' involving the collection of sediment cores (getting muddy!), followed by organic carbon content determination and radiometric dating. The successful student must be comfortable working in the field (drivers licence required), and experience in ecology, chemistry, and/or geology. Good interpersonal skills are critical – the successful individual will need to work as part of a team, and will be required to liaise with private land-holders.