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BSc Advanced Hons (Class 1)

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Summary

Floods are the main facilitators for catchment erosion and deposition of large quantities of sediment into estuaries and coastal bays. Sediments can act as both a source and sink for nutrients and trace metals, which may become biologically available. This project aims to explore the relationships between estuarine organisms and the sediments on which they live. Specifically, small fish, penaeid prawns and other organisms will be collected from Moreton Bay on several occasions and food web dynamics (constructed from trace metals and stable isotopes) will be compared between organisms living on flood sediment deposits to those living on marine influenced areas. Conditional indicators such as lipid extractions will be used to compare condition of these organisms. To improve understanding of how nutrients are released from catchment soils during a flood, several soil types were collected from catchments surrounding the Brisbane River and used in a flood simulation experiment. The results of this experiment suggest that catchment soils, particularly basalt soils, may provide ongoing nutrient supply to estuaries after deposition. A radiotracer experiment was carried out at the Australian Nuclear Science and Technology Organisation (ANSTO) in Sydney to help improve understanding of how trace metals are accumulated at different trophic levels in estuarine food webs. Sand clams, school prawns and sand whiting were exposed to cadmium, manganese and zinc in dissolved, suspended sediment and dietary forms and lower trophic level organisms, particularly the sand clams, were found to be most sensitive to these metals. Accumulation of these metals in school prawns and sand whiting was highest through dietary ingestion of contaminated food, however the sand whiting assimilated very little of these metals.

Research Expertise

- Fish biology
- Estuarine food web dynamics
- Sediment-nutrient flux
- Sediment contamination effects on organisms
- Water and sediment quality monitoring and management
- Aquatic animal laboratory experiments