

phosphorous concentrations ($0-15 \mu\text{g P l}^{-1}$) and 4 high concentrations of iron manganese in the sediment which readily bound available phosphorus in the water column. This paper focuses on research to improve water quality and promote phytoplankton and macroinvertebrate growth in the lakes of the RGC Wetlands system. Experimental amelioration of the water quality at first utilised wetland microsystems (94 mm ID PVC tubes of ~5L capacity), then 2 m² enclosures in the lakes and finally whole lake trials. The major findings of these studies were: 1. increasing the pH to neutral did not adversely affect the aquatic ecosystem, despite the high ammonium concentrations, 2. increasing the phosphorus concentration of the water resulted in increased phytoplankton growth but the sediments rapidly bound up to 98% of inorganic phosphorus added, 3. addition of organic material which contained phosphorus (straw or hay) increased the phosphorus concentration of the water, increased algal growth in the system and blanketed the effects of the sediment by reducing the contact between the sediment and water column and 4. the ideal mechanism to increase organic matter in the lakes was through cultivation of aquatic emergent macrophytes (sedges etc) around the perimeter of the lakes.

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Created wetlands: three techniques for stimulating benthic macro-invertebrate production and diversity

The construction of wetlands for waterfowl conservation must address the fundamental issues of invertebrate production for the establishment of a foodweb capable of supporting laying hens and fledglings. This paper reports on three studies in created wetlands at the RGC Wetlands Centre, Capel, Western Australia. Changes in the standing biomass and species richness of benthic macro-invertebrates in response to; a) the addition of soluble phosphate, b) the addition of straw and c) the presence of macrophytes were investigated in three separate "whole lake" studies. The main findings were; 1) all treatments resulted in an increase in macro-invertebrate species richness and standing biomass, 2) phosphorus addition resulted in an increased numerical dominance of a smaller number of taxa, which was not observed in other treatments and, 3) both the addition of phosphorus and of straw resulted in changes in community structure, with up to 50% of the pre-treatment taxa replaced, or only remaining in low abundance, after the 12 month study period. Straw addition and the presence of macrophytes increased both food availability and habitat structure, however, in contrast the addition of phosphorus only increased food availability. The relative importance of food availability and habitat are discussed. The cultivation of macrophytes in created wetlands is emphasised as having potential for increasing habitat structure and detritus, the basis of aquatic food-chains.

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Remote sensing for research and control of malaria in Belize

Remote sensing (RS) is particularly helpful for assessing the location and extent of vegetation formations, such as herbaceous wetlands, that are difficult to examine on the ground. Certain types of these wetlands provide larval habitats for malaria transmitting mosquitoes. In central America, larval stages of one of the most widely spread and important malaria vectors, *Anopheles albimanus*, are often associated with herbaceous wetlands. A long-term multidisciplinary research program has been under way to research the possibilities of applying RS and GIS technologies to target and manage *Anopheles* mosquito control in the country of Belize. Multispectral satellite data have been used to predict malaria "hot spots" based on our understanding of environmental factors that determine the presence of disease vectors. Marshes that are sparsely populated with emergent macrophytes and dense algal mats (Cyanophyta) were identified as very productive *Anopheles albimanus* larval habitats. Algal mats were found to be preferentially targeted by ovipositing mosquito females in comparison to water without algal mats. These marshes were located on a classified multispectral SPOT image and distances between marshes and human habitation used as predictors of adult mosquito densities. Predictions for the dry season were >90% accurate. Preliminary analysis of the wet season data indicates the predictions using the dry season imagery and distance to marshes to be less accurate.

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Diatoms as indicators of water quality of the Canning River

The objective was to investigate the use of diatoms as tools for assessing water quality. The technique of collecting diatom samples was focused in this study. Artificial substrates in the form of glass slides were used for collecting periphytic diatoms. There were 68 taxa of diatoms belonging to 25 genera collected. *Navicula* (11 taxa) *Nitzschia* (18 taxa) were the most abundant genera. The majority of the taxa ranged from oligohalobious to mesohalobious reflecting the salinity range of the Canning River. The diatom taxa were alkaliphilous indicative of eutrophic waters.

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Studies on ecological distribution of *Hibiscus moscheutos* in constructed wetlands and soil moisture

The role of buried-soil seeds in succession from 1 to 30 years was studied in 13 constructed wetlands in the Eastern Shore of Chesapeake Bay, USA. Three soil samples were collected from surface soil of 5 cm deep of 4 zones in each wetland. Seed number in soil was estimated by the number of germinated seedling from the soil sample. Seedlings were grown until adults for the identification of plants. Seed number and species diversity of aquatic plants in transect line

An abstract painting of a wetland landscape. The scene is dominated by a large, dark, textured shape on the left, possibly a tree or a large rock, rendered in shades of brown, black, and green. The background is a mix of green, blue, and yellow, suggesting water and vegetation. In the foreground, a dragonfly with a long, segmented body and large, transparent wings is depicted in flight. The dragonfly's body is dark, and its wings are light with dark veins. The overall style is expressive and painterly, with visible brushstrokes and a rich color palette.

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