We surveyed plant communities in 221 playas in spring and again in summer over a 160,000 km^2 areas. Species turnover between spring and summer was estimated as it was potentially affected by hydrological events. Floral community composition also was compared between playas with cropland vs. grassland watersheds. The average species similarity between spring and summer was only 38% on the 221 playas even though species richness remained the same. Much of this turnover can be attributed to hydrological events. Plant community composition varied between playas with grassland versus annual cropland watersheds. However, plant species richness was not affected by watershed landuse. Watershed landuse has changed the hydrology of playas (through sedimentation) and ultimately their plant community composition even though species diversity remains similar.

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Cyanobacterial blooms and eutrophication of the Canning River, Western Australia

The Canning River is the southern tributary of the Swan River estuary around which the city of Perth, Western Australia is built. It is here that a massive bloom of the toxic cyanobacteria *Anabaena circinalis* (0.82 mg/L of Chlorophyll a) occurred in early 1994. The population dynamics, succession, and ecology of phytoplankton in this river were investigated from February 1994 to July 1995, for the first time. The building of a weir and large dam upstream and catchment degradation have contributed to the eutrophication of the river. Cyanobacteria formed the major proportion of the phytoplankton. In winter this was most frequently *Oscillatoria spp* or *Schizothrix spp*. The summer succession began with diatoms, followed by a series of blooms of various chlorophyta and cyanobacteria until *Anabaena*, or *Anabasnopsis* occurred in high numbers in late summer. The shaded creek site had lower summer populations than the lower sites and a much lower range of phytoplankton types. The intrusion of salt water into the system at the beginning of the 1994-95 summer, due to variation from the normal summer weir height, was associated with a dinoflagellate bloom. Concentrations of chlorophyll a, phosphates and nitrogen compounds were characteristic of eutrophic systems. Factors which appeared to contribute to the cyanobacterial dominance were the high nutrients with low N:P ratio, and low light penetration which appeared linked to the high gilvin content. The toxic species appear restricted to higher water temperatures and low salinity.

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Arsenic dynamics in a shallow contaminated wetland

The potential for arsenic to be remobilised during resuspension of contaminated sediments in a shallow wetland was investigated. Despite a distinct source of arsenic on one shore of the lake, no trends were found in the sediment arsenic concentrations across the lake. This indicated that biological, chemical or physical processes were continually remobilising arsenic through the lake. One of the most likely mechanisms in such a shallow lake is resuspension of bottom sediments. An arsenic maximum was also found 10 cm below the surface of the sediment in a settled flocculant layer that was predominantly made up of decaying plankton. Remobilisation of arsenic from this layer during resuspension was simulated with elutriate tests, carried out under both oxic and anoxic conditions. Under oxic conditions the amount of arsenic released was correlated to the initial sediment arsenic concentrations, indicating that porewater was the source of arsenic. However in the anoxic experiments, no such correlations were evident suggesting biological or chemical processes were interfering with the redox potential and therefore the release of arsenic. The biological, chemical and physical processes described here are likely different to those that dominate contaminant cycling in deeper water bodies.

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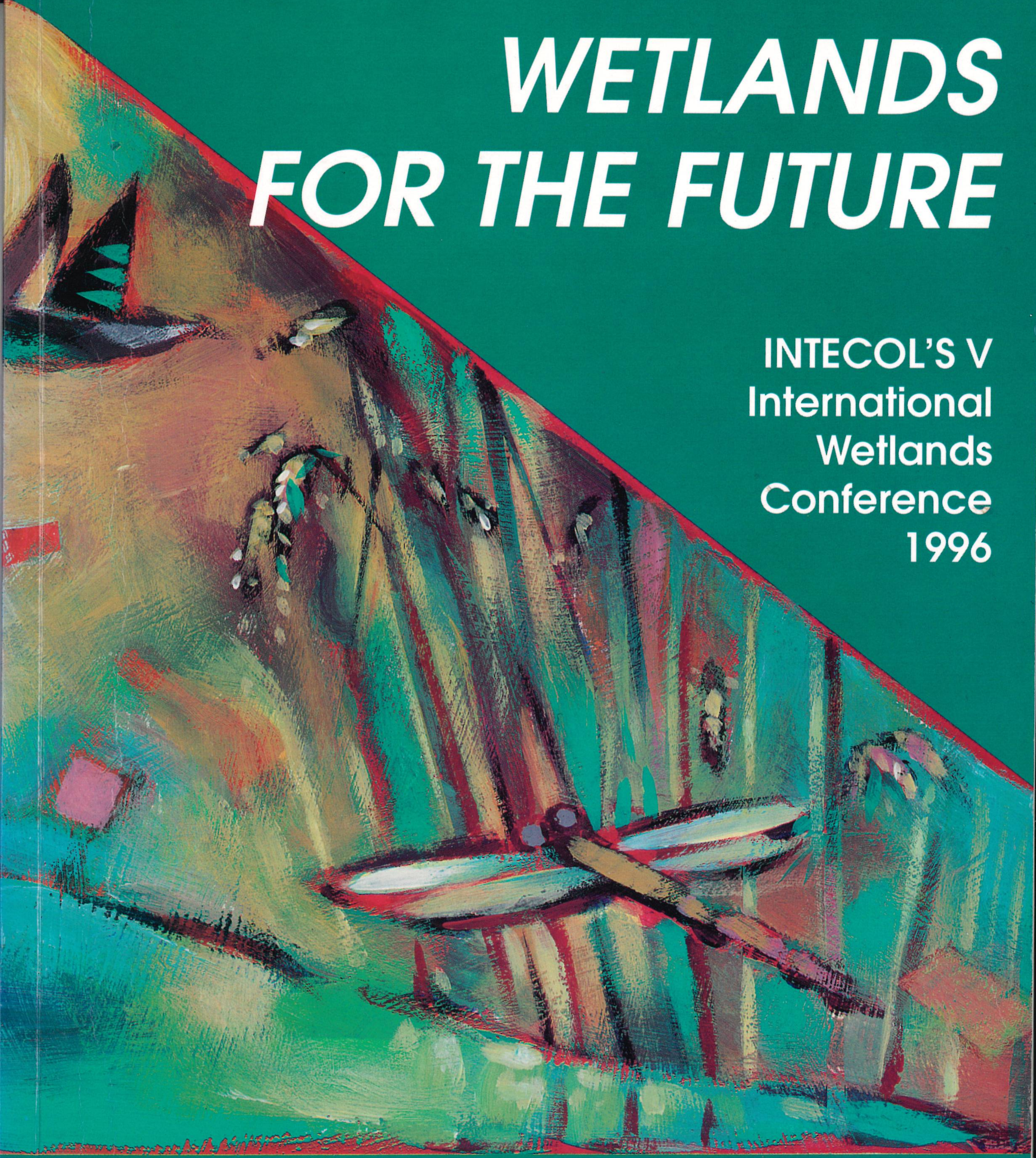
Role of detritus in support of grazing food webs in freshwater wetlands

The grazing food web of a coastal wetland on Lake Superior of the Laurentian Great Lakes has been shown, using stable isotope ratios of carbon and nitrogen, to derive fixed carbon from phytoplankton. Vascular macrophytes and their epiphyton do not appear to be directly involved. Results of an *in situ* experiment show, however, that decomposition of vascular macrophytes can contribute respired inorganic carbon to wetland waters in sufficient quantity to support phytoplankton production. Such recycled carbon, as ^{13}C-depleted CO_2 and HCO_3-, is apparently taken up by phytoplankton and transferred on to the consumers of the fishery food web. Thus macrophyte biomass appears to be contributed indirectly, via detrital pathways, to grazers. In addition, detrital pathways in wetlands serve to supplement the supply of available inorganic carbon, thus enhancing overall ecosystem productivity. This pattern will be shown for Lake Superior, a softwater system; complementary data will also be presented from lake Michigan (Green Bay), a calcareous ecosystem with natural supplies of carbonate from geologic sources in the watershed.

WETLANDS FOR THE FUTURE



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CONFERENCE PROGRAMME AND BOOK OF ABSTRACTS

22-28 September 1996 Perth, Western Australia

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