EUTROPHICATION COMPREHENDIUM:
FITZROY RIVER CATCHMENT

NATIONAL EUTROPHICATION MANAGEMENT PROGRAM
Eutrophication Compendium: Fitzroy River Catchment

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Produced for the Queensland Department of Natural Resources

As part of the
National Eutrophication Management Program

Sponsored by the
Land and Water Resources Research and Development Corporation
and the
Murray Darling Basin Commission
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Acknowledgements

Many thanks go to those people who gave up their time to reply to our surveys, phone calls, faxes, and Emails for information on studies in the Catchment, and in particular those who contributed information or led us to those who did. We especially thank Maurie Clewley, Nigel Kelly, Don Yule and Bob Noble who provided very useful advice. Also we are grateful for Gail Pickering and other staff at CQU who spent hours deciphering handwriting and typing in the entries.

We are indebted to Pam Handiside (Manager of STREAMLINE) who provided useful information and we thank Kate Houston (CQU Library) for her help in the initial stages of preparation of the format. Thanks go to Dave Downer and Tony Bertolotti of the CQU Publishing Unit (Dave designed the cover of the book) and to Larelle Fabbro who provided the photograph of *Cylindrospermopsis raciborskii* for the background of the cover.

Finally, we thank Trent Attard for his work in tracking down complete versions of published papers; the staff at the Queensland Department of Natural Resources and Queensland Department of Primary Industries and Prof. Errol Payne (CQU) who accommodated our requests to view documents; and to every one else who helped in small but valuable ways.
Preface

In recent years major water supplies have had to suspend operations as a result of large algal blooms. This is because algal blooms will, at times, produce toxins that endanger the health of people and animals using the water. Blooms may also cause water quality deterioration by producing taste and odour problems, or by reducing the amount of oxygen in the water to a level where fish kills may result. Fortunately, we now know a lot more about algal blooms than we did in the past. We now know that blooms are not always visible from the surface: the highest concentration of algae can be at a depth of three or four metres. This often occurs in tropical areas of Australia. We know also that some toxins, for example the cylindrospermopsin produced by the alga *Cylindrospermopsis raciborskii* (shown on the front cover of this book), do not have any taste or odour associated with them. Hence there is a need for careful algal monitoring and testing of water supplies for algal toxin production.

In order to prevent algal blooms and the problems they cause, it is crucial to understand that a bloom can only occur if there is a sufficient nutrient supply for the algae. Thus nutrient enrichment of water bodies (known as eutrophication) is of increasing concern in Australia.

As a result, the National Eutrophication Management Program (NEMP) was set up by the Land and Water Resources Research and Development Corporation and the Murray-Darling Basin Commission. It was established to undertake research and communication activities necessary to reduce the frequency and intensity of harmful or undesirable algal blooms in fresh and estuarine waters (Davis (1996) - see p. 24). To this end, four representative “focus catchments” were chosen for investigation (so as to maximise the use of program resources), and the Fitzroy Catchment in Central Queensland was the one chosen as representative of sub-tropical and tropical Australia.

The Fitzroy Catchment is the largest river catchment draining to the east coast of Australia, and it comprises approximately eleven percent of Queensland’s arable land. The catchment is characterised by a semi-arid climate with rainfall associated generally with monsoonal troughs and tropical rain depressions during the December - March wet season; and by a high diversity of topography, soil types, natural vegetation cover, and land use (including agricultural, mining and urban). It is a rapidly developing area both economically and physically with major agricultural, mining, industrial, and water infrastructure development projects underway. The catchment also leads the way in water management in the state - the Fitzroy being the subject of Queensland’s first Water Allocation and Management Plan, which is about to be released. This aims to balance economic and environmental needs. However, water bodies in the catchment are still subject to massive algal blooms that often last much longer than those in temperate areas of Australia. The diversity of algal species in the catchment is also very high, with most of the potentially toxic algal species found in Australia having been recorded from the catchment.

In recognition of the fact that part of the solution to algal problems is increased
awareness of eutrophication and its causes, the sponsors of the National Eutrophication Management Program approached the Queensland Department of Natural Resources to produce a compendium of information relevant to eutrophication in the Fitzroy Catchment. Consequently, Central Queensland University was commissioned by the Department to produce the compendium. The compendium is aimed at being of direct use to the community, water managers, and researchers in both the Fitzroy Catchment and other catchments of Australia.

To produce the compendium, information broadly relevant to eutrophication was gathered from a wide range of sources. Initially, electronic data bases (including STREAMLINE and ARRIP (Australian Rural Research In Progress)) were searched and the results edited and divided into categories based on the contents of the abstracts or a full copy of the paper where available. As per the project brief, studies broadly relevant to eutrophication were included. Many other studies, such as those dealing specifically with salinity, geomorphology, or pesticides were not included. Further information was extracted from key publications on the Fitzroy Catchment and the National Conference on the Downstream Effects of Land Use held in catchment in 1995 (Hunter et al. 1996). The Proceedings of the Fitzroy Catchment Symposium, with over 800 pages (Duivenvoorden et al. 1992 – see p. 12), was particularly useful. Lastly, information was also obtained from surveys of people thought likely to have information on eutrophication in the catchment. Approximately 200 letters were sent out for the initial survey, and these were intensively followed-up for replies and/or clarification. These surveys provided most of the information on current work in the catchment and details of other work not found by other means.

The relevant works fell clearly into three categories: published or reported work, unpublished and unreported work, and work currently in progress. To provide the reader with user-friendly access to this information, each category was divided into 11 subsections relevant to particular subject areas. An emphasis was placed on different land uses and their relationship to eutrophication.

It is important to note that many works are relevant to a number of subject areas and that these entries have not been duplicated but can be traced using the three indices included: the subject index, the author index and the index to major and minor water bodies in the catchment.

For ease of reference (and to facilitate updating of the compendium), the format of individual entries was modeled on that of the STREAMLINE database. Furthermore, some extra descriptive parameters were added and others deleted to increase the book’s usefulness and readability.

The parameters added were the frequency of data collection (FQ:), the duration of data collection (DU:) and the accessibility of the document or data (AC:). In addition, for current work, descriptors added were the objectives of the work or study (OB:), the current state of progress of the work (ST:) and a contact point for further information about the work (CP:). For easy reference, a key to the descriptors used is presented at the foot of each page.