

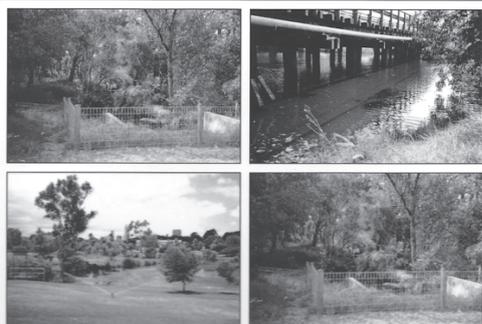
Book Review

A Diatom Prediction Model and Classification for Urban Streams from Perth, Western Australia.

A Diatom Prediction Model and Classification for Urban Streams from Perth, Western Australia by Jacob John

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A Diatom Prediction Model and Classification for Urban Streams from Perth, Western Australia



Jacob John

Diatoms are well known to be sensitive indicators of environmental conditions. This informative volume investigates the relationship between these unicellular algae and the health of urban streams and drains in Perth, Western Australia. It represents a synthesis of the author's earlier volumes *Diatom Prediction and Classification System for Urban Streams* and *A Guide to Diatoms as Indicators of Urban Stream Health*.

The tone of the volume is set in the opening pages with a dedication to Professor Ruth Patrick, a pioneer of river health assessment using diatoms. The material that follows is divided into five main chapters, appended diatom iconographs and selected site descriptions.

The introductory chapter commences with a case study of an unexpected cyanobacterial bloom in the Swan

River estuary. This effectively outlines the influence of urban streams and drains and their associated nutrients on the water quality of Perth's major rivers, providing context for the work presented. The case study is followed by a well-rounded literature review addressing various facets of water quality, management and monitoring. Particular attention is paid to the impact of urbanisation in the Perth region, with examples of nutrient loads and drainage systems. A strong case for the use of diatoms as bioindicators is also made. The first chapter ends with the objectives of the project, a primary theme being the use of diatoms to classify and assess the health of urban streams and drains in Perth.

Chapter 2 provides an overview of the study area, outlining the relationship between the Swan River estuary, associated catchments and tributaries, primary among these being the Canning River, Helena River and Ellen Brook. A main focus however, is the growing issue of eutrophication in the estuary and the factors driving this process. The author elaborates on the various sources of nutrients, in particular urban streams and drains, some of which are known to make a substantial contribution to nutrient loading in the Swan River estuary. The final section of Chapter 2 outlines the selection of sampling sites; 200 sites chosen to represent the urban catchment area around the Swan–Canning estuary system. Insight is given into the classification of these streams and drains into reference (relatively pristine) and monitoring (impacted), based on parameters such as water quality, surrounding land-use and peripheral vegetation.

Chapter 3 provides further detail on site locations before presenting field and laboratory methods. This leads into a comprehensive section on data analysis, providing a good background for the results to follow. The spreadsheet and example calculations referred to in relation to the diatom index (Appendix 3/3a) are not included in the volume, but are available on request from the author.

A large sample size has enabled the compilation of robust sets of environmental and biotic data (including fresh periphyton and diatom counts) from the urban streams and drains of Perth. The author has used these data to great effect, employing a suite of statistical analyses to explore the relationship between the distribution of diatom communities and stream/drain conditions (Chapter 4).

Of particular note is a two-way table which allows the reader to examine the patterns in the diatom data from both a species and site perspective. From this, groups of sites dominated by indicator species for either reference or monitoring (impacted) conditions can be identified. Another feature is the diatom index, a tool developed to help classify and assess the health of urban streams and drains using diatom assemblages. The data treatments have also resulted in the reclassification of almost 160

sites and the identification of various diatom indicator species, each with potential applications for monitoring and management of urban streams and drains in Perth.

The final chapter (Chapter 5) brings together the findings of the study, outlining the major achievements. The concluding remarks are well presented in succinct summary points, incorporating recommendations for future work. The diatom iconographs that follow are a very useful addition, helping to build knowledge of diatom taxonomy in the region.

The volume is nicely presented in a durable hardcover format, with the inner material printed in black and white. While the black and white presentation tends not to detract from the overall message, some of the figures would have benefitted from the use of colour and increased resolution on printing. Presentation within the volume could also have been improved by the correction of some formatting and typographical issues, in particular labelling errors and the placement of figure

headings in Chapter 4. Amendment would be recommended for any future updates of the volume.

Overall, the volume provides substantial information on the diatoms of Perth's urban streams and drains. It also highlights the usefulness of this algal group for bioassessment. In addition, the information and techniques presented could potentially be adapted to assess urban stream health in other regions. The volume represents a valuable resource, recommended for local government officers, environmental consultants, students and those involved in the management of rivers and urban streams.

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