

# **Bioassessment of Freshwaters Using Benthic Macroinvertebrates- A Primer**

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*(Project E-1)*

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*(a volunteer scientific stakeholder group)*

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Photo Credits:

*(Front cover:* An example of a group of littoral lake benthic macroinvertebrates collected by Benthic Ecologist, Monica Gaertner and Biologist, Angela Jarvis during Oct.-Nov. 1998. Videograph-still provided by volunteer, Research Biologist, Peter Shacklock during Jan. 1999.

*Back cover:* A dissecting microscope photograph taken by Benthic Ecologist, Monica Gaertner and Biologist, Angela Jarvis at the Lab of one of our major benefactors, the National Research Council of Canada during January, 1999. The photograph is of a damselfly larva, Order Odonata, Suborder Zygoptera, Family Coenagrionidae, magnification 12X)

# **D**EDICATION

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## FOREWORD

This Report is intended as a 'Primer' in order to stimulate scientific interest in the very necessary domain of Freshwater Biodiversity and Ecology using Benthic Macroinvertebrates. The Report has been divided into various free-standing chapters so that copies of any of these chapters could be supplied to interested parties. The major emphasis of the First Edition is placed on Chapter II- Freshwater Benthic Ecology. Each chapter has its own relevant references which the author consulted in the evolution of the chapters. Each chapter has also been page-numbered independent of other chapters in order to be free-standing, and the lengthier chapters have their own independent 'Contents' section. The Appendices are quite significant and one of those has pristine chemical data from Nova Scotia lakes. The last appendix contains a synopsis of some of the extensive work conducted by us and widely available either on the WWW and/or at local university libraries.

The author herewith expresses a special salutation to Prof. Dr. Gerald L. Mackie PhD of the University of Guelph, Ontario who was kind and charitable enough in sharing his yet unpublished class textbook with the author. When the said textbook is published this year as planned, it will most probably be among the most widely sought after books dealing with the relevant topics of aquatic sciences, both as a textbook for limnologists-in-training as well as a "must-have" reference book for senior researchers in the fascinating domain of Limnology (i.e. the science of Lakes and Running Waters).

The author also expresses his deep appreciation to Dr. Keith M. Somers PhD, Scientist with the Dorset Research Centre of the Ontario Ministry of the Environment & Energy for his assistance during the long years of 1997 and 1998. Dr. Somers is among the leaders in developing simple but credible protocols for bioassessment that are easily accomplished by researchers on low budgets and/or by the general but intelligent and dedicated public!

Further, the author expresses his intense gratefulness and special salutations to Dr. Robert W. Bode PhD, Senior Scientist with the New York State Department of Environmental Conservation for his consistent advice and encouragement. Dr. Bode is an unquestioned world-class leader in Freshwater Benthic Ecology, and has been quoted extensively by numerous leading researchers including but not limited to Prof. Dr. Gerrie Mackie, Dr. Keith Somers, and various senior researchers with the U.S. EPA. The handbooks prepared under the scientific supervision of Dr. Robert Bode are an unparalleled treasure in the exciting and fascinating domain of Biodiversity and Benthic Ecology overall!

The Soil & Water Conservation Society of Metro Halifax ('SWCS') is a totally volunteer society dedicated to the advancement of Theoretical/Applied Limnology and Lake Management, and is composed of membership/associateship principally from all over Metro Halifax, with a handful from the rest of Nova Scotia, as well as from Ontario and parts of the U.S. We salute all our active members/associates as well as collaborators for their intense concern and co-operation in our operations, predominantly on an Applied Sciences level.

The members/associates of the Soil & Water Conservation Society of Metro Halifax salute the Federal Government of Canada for its understanding and co-operation with our totally volunteer society. It is our humble belief that the philosophy of **“Think Globally, Act Locally”** has been adhered to in this worthwhile project!

Our objects are:

- (a) To research, synthesize and compile scientific literature, carry out monitoring programs, carry out case studies, carry out public education programs on the visual as well as the printed media, lobby regulatory agencies, etc. on a voluntary/partnership basis. In addition, if time and opportunity permit, to carry out research on a scientific as well as technical basis independently, and/or in collaboration with private and public institutions, and
- (b) To assist and advice individuals, groups, organizations, cities and towns, and county, and provincial, federal and international governments in reducing the costly waste of land and water resources and in putting to good use these assets.

*And primarily concentrate in Theoretical/Applied Limnology (i.e. scientific study of Lakes and Running Waters) as well as in Lake Management and Freshwater Benthic Ecology. Also entering the domain of sustainable development (freshwater/marine eco-systems)*

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