JOURNAL OF GREAT LAKES RESEARCH

ISSN:0380-1330 Devoted to Research on Large Lakes of the World CODEN: JGLRDE

VOL. 30 2004 Supplement 1

EXPLORING SUPERIOR

CONTENTS

Foreword. **Martin T. Auer and Thomas C. Johnson** i

Late Holocene lake-level variation in southeastern Lake Superior: Tahquamenon Bay, Michigan. **John W. Johnston, Steve J. Baedke, Robert K. Booth, Todd A. Thompson, and Douglas A. Wilcox** 1

Trends in the Lake Superior water budget since 1948: a weakening seasonal cycle. **John D. Lenters** 20

A non-orthogonal primitive equation coastal ocean circulation model: application to Lake Superior. **Changsheng Chen, Jianrong Zhu, Lianyuan Zheng, Elise Ralph, and Judith Wells Budd** 41

Exchange of water between the Keweenaw Waterway and Lake Superior: characteristics and forcing mechanisms. **James H. Churchill, W. Charles Kerfoot, and Martin T. Auer** 55

The spring runoff event, thermal bar formation, and cross margin transport in Lake Superior. **Martin T. Auer and Thomas L. Gatzke** 64

Temporal dynamics of nutrients (N and P) and hydrology in a Lake Superior coastal wetland. **John A. Morrice, John R. Kelly, Anett S. Trebitz, Anne M. Cotter, and Michael L. Knuth** 82

Photochemical transformation of dissolved organic carbon in Lake Superior—an in-situ experiment. **Xiaodong Ma and Sarah A. Green** 97

Carbon and nutrient cycling at the sediment-water boundary in western Lake Superior. **Erik A. Heinen and James McManus** 113

The benthic nepheloid layer (BNL) north of the Keweenaw Peninsula in Lake Superior: composition, dynamics, and role in sediment transport. **Noel R. Urban, J. Jeong, and Yingtao Chai** 133

Sediment trap studies in Lake Superior: insights into resuspension, cross-margin transport, and carbon cycling. **Noel R. Urban, Xuefei Lu, Yingtao Chai, and Defne S. Apul** 147

Local, regional, and global implications of elemental mercury in metal (copper, silver, gold, and zinc) ores: insights from Lake Superior sediments. **W. Charles Kerfoot, S. L. Harting, J. Jeong, John A. Robbins, and Ronald Rossmann** 162

Genetic structure and community DNA similarity of picoplankton communities from the Laurentian Great Lakes. **David A. Pascoe and Randall E. Hicks** 185

Annual and offshore changes in bacterioplankton communities in the western arm of Lake Superior during 1989 and 1990. **Randall E. Hicks, Peter Aas, and Christine Jankovich** 196

Heterotrophic bacterioplankton dynamics at a site off the southern shore of Lake Superior. **Martin T. Auer and Kimberly D. Powell** 214

Community respiration rates in Lake Superior. **Noel R. Urban, Defne S. Apul, and Martin T. Auer** 230

Sensitivity of phytoplankton to copper in Lake Superior. **Michael R. Twiss, Kim J. Rattan, Robert M. Sherrell, and R. Michael L. McKay** 245

The deep chlorophyll maximum in Lake Superior. **Richard P. Barbiero and Marc L. Tuchman** 256

Selected features of the distribution of chlorophyll along the southern shore of Lake Superior. **Martin T. Auer and Laura A. Bub** 269

Toward resurrection ecology: *Daphnia mendotae* and *D. retrocurva* in the coastal region of Lake Superior, among the first successful outside invaders? **W. Charles Kerfoot, Xiao Ma, Christe S. Lorence, and Lawrence J. Weider** 285

(Continued on page 493)

Continued from back cover

Fitting into food webs: behavioral and functional response of young lake trout (*Salvelinus namaycush*) to an introduced prey, the spiny cladoceran (*Bythotrephes cederstroemi*). **D. Rae Barnhisel and W. Charles Kerfoot** 300

Colonizing inland lakes: consequences of YOY fish ingesting the spiny cladoceran (*Bythotrephes cederstroemi*). **Justin A. Compton and W. Charles Kerfoot** 315

Changes in the Lake Superior crustacean zooplankton community. **Jason Link, James H. Selgeby, and Robert E. Keen** 327

Abundance and distribution of benthic invertebrates, with emphasis on *Diporeia,* along the Keweenaw Peninsula, Lake Superior. **Nancy A. Auer and Jason E. Kahn** 340

Status of the amphipod *Diporeia* spp. in Lake Superior, 1994–2000. **Jill V. Scharold, Stephen J. Lozano, and Timothy D. Corry** 360

Inshore-offshore distribution of larval fishes in Lake Superior off the western coast of the Keweenaw Peninsula, Michigan. **Jason K. Oyadomari and Nancy A. Auer** 369

Discrimination among spawning aggregations of lake herring from Lake Superior using whole-body morphometric characters. **Michael H. Hoff** 385

Spatial patterns in assemblage structures of pelagic forage fish and zooplankton in western Lake Superior. **Timothy B. Johnson, Michael H. Hoff, Anett S. Trebitz, Charles R. Bronte, Timothy D. Corry, James F. Kitchell, Stephen J. Lozano, Doran M. Mason, Jill V. Scharold, Stephen T. Schram, and Donald R. Schreiner** 395

Lake herring (*Coregonus artedi*) and rainbow smelt (*Osmerus mordax*) diets in western Lake Superior. **Timothy B. Johnson, William P. Brown, Timothy D. Corry, Michael H. Hoff, Jill V. Scharold, and Anett S. Trebitz** 407

Biotic and abiotic factors related to rainbow smelt recruitment in the Wisconsin waters of Lake Superior, 1978–1997. **Michael H. Hoff** 414

Biotic and abiotic factors related to lake herring recruitment in the Wisconsin waters of Lake Superior, 1984–1998. **Michael H. Hoff** 423

Relationships between bald eagle productivity and dynamics of fish populations and fisheries in the Wisconsin waters of Lake Superior, 1983–1999. **Michael H. Hoff, Michael W. Meyer, Julie Van Stappen, and Thomas W. Fratt** 434

Evaluation and regional optimization of bio-optical algorithms for central Lake Superior. **Hanyi Li, Judith W. Budd, and Sarah A. Green** 443

Satellite-based sediment and chlorophyll *a* estimates for Lake Superior. **Judith W. Budd and Daniel S. Warrington** 459

Large-scale transport phenomena in the Keweenaw region of Lake Superior: the Ontonagon plume and the Keweenaw eddy. **Judith W. Budd** 467

Some notes on water color in Keweenaw Bay (Lake Superior). **Herman J. Gons and Martin T. Auer** 481

Author Index 490

Subject Index 490

Reviewer Index 491