



Great Lakes

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Sampling and Analytical Procedures for GLNPO's Open Lake Water Quality Survey of the Great Lakes

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- [Standard Operating Procedure for The Analysis of Metals in Waters and Wastewaters by ICP Method 200.7 Using the Perkin Elmer Optima 3300 DV and 43 DV, Original \(PDF\) \(29 pp.439 kb\)](#)

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- [Standard Operating Procedure for Meteorological Data Aboard the R/V Peter Wise Lake Guardian, Revision 02 \(PDF\) \(7 pp.42 kb\)](#)
- [Operating the Seabird CTD, Original \(PDF\) \(5 pp.33 kb\)](#)
- [Standard Operating Procedure for the Sampling and Analysis of Total Suspended Solids, Revision 04 \(PDF\) \(10 pp.142 kb\)](#)
- [Standard Operating Procedure for the Determination of Dissolved O₂ Correction Factors, Revision 01 \(PDF\) \(7 pp.48 kb\)](#)

[Standard Operating Procedure for Determination of Dissolved Oxygen in Lake Erie \(See Appendix D\)](http://www.epa.gov/grtlakes/monitoring/sop/index.html)
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Chapter 4: Biological Parameters

[Introduction](#) (PDF) (6 pp.39 kb)
[Standard Operating Procedure for Phytoplankton Sample Collection and Preservation Field Procedures, Revis](#)
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[Measurement Field Procedures, Revision 10](#) (PDF) (9 pp.163 kb)
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[Standard Operating Procedure for Chlorophyll a Sampling Method Field Procedure, Revision 06](#) (PDF) (7
pp.59 kb)
[Standard Operating Procedure for In Vitro Determination of Chlorophyll a in Freshwater Phytoplankton by](#)
[Fluorescence, Revision 07](#) (PDF) (12 pp.244 kb)
[Standard Operating Procedure for Benthic Invertebrate Field Sampling Procedure, Revision 07](#) (PDF) (9
pp.118 kb)
[Benthic Invertebrate Laboratory Procedure, Revision 06](#) (PDF) (14 pp.104 kb)

Chapter 5: Board Chemistry Parameters

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[Standard Operating Procedure for GLNPO Board Analysis, Revisions 07](#) (PDF) (15 pp.107 kb)
[Standard Operating Procedure for Dissolved Oxygen Micro Method, Winkler Titration, Revisions 06](#) (PDF)
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[Standard Operating Procedure for Total Phosphorous in Sediments by Persulfate Oxidation Digestion](#)
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Appendices:

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**EPA-Great Lakes National Program Office Limnology Program
Peer-reviewed Journal Publications**

2012

Barbiero, R.P., B.M. Lesht, and G. J. Warren. 2012. Convergence of trophic state and lower food web in Lakes Huron, Michigan and Superior. *Journal of Great Lakes Research* 38: 368-380

2005

Burns, N. M., D.C. Rockwell, P.E. Bertram, D.M. Dolan, and J.H. Ciborowski. 2005. Trends in temperature, secchi depth, and dissolved oxygen depletion rates in the central basin of Lake Erie, 1983–2002. *Journal of Great Lakes Research* 31(sup2):35-49.

Matisoff, G. and J.J.H. Ciborowski. 2005. Lake Erie trophic status collaborative study. *Journal of Great Lakes Research* 31(sup2):1-10.

Rockwell, D.C., G.J. Warren, P.E. Bertram, D.K. Salisbury, and N.M. Burns. 2005. The U.S. EPA Lake Erie indicators monitoring program 1983–2002: trends in phosphorus, silica, and chlorophyll *a* in the central basin. *Journal of Great Lakes Research* 31(sup2):23-34.

Twiss, M.R., T.A. Langen, G.S. Bullerjahn, S.W. Wilhelm and D.C. Rockwell. 2005. The Lake Ontario Great Lakes Science Practicum: a model for training limnology students on how to conduct shipboard research in the Great Lakes. *Journal of Great Lakes Research* 31(2):236-242.

Warren, G.J. 2005. Nutrients. *In* The state of Lake Michigan in 2000. Edited by M.E. Holey and T.N. Trudeau. Great Lakes Fish Comm. Spec. Pub. 05-01., pp. 21-24.

Warren, G.J. and R.G. Kreis. 2005. Recent and long-term nutrient trends in Lake Michigan. *In* T. Edsall and M. Munawar (eds.), *State of Lake Michigan: Ecology, Health and Management*. Backhuys Publishers, The Netherlands, pp. 141-155.

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Warren, G.J. and P.J. Horvatin. 2003. Great Lakes monitoring results- Comparison of probability based and deterministic sampling grids. *Environmental Monitoring and Assessment* 81:63-71.

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Barbiero, R.P., M.L. Tuchman, G.J. Warren, and D.C. Rockwell. 2002. Evidence of recovery from phosphorous enrichment in Lake Michigan. *Canadian Journal of Fisheries and Aquatic Sciences* 59: 1639-1647.

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Makarewicz, J.C., P. Bertram, and T.W. Lewis. 2000. Chemistry of the offshore surface waters of Lake Erie: Pre- and post-Dreissena introduction (1983-1993). *Journal of Great Lakes Research* 26(1): 82-93.

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Bertram, P.E. 1993. Total phosphorus and dissolved oxygen trends in the Central Basin of Lake Erie. *Journal of Great Lakes Research* 19(2):224-236.

Esterby, S.R., P.E. Bertram. 1993. Compatibility of sampling and laboratory procedures evaluated for the 1985 three-ship intercomparison study on Lake Erie. *Journal of Great Lakes Research* 19(2):400-417.

Makarewicz, J.C., P. Bertram. 1993. Evidence for the restoration of the Lake Erie ecosystem. *Journal of Great Lakes Research* 19(2):197.