Title: Long-term change in the trophic status and mixing regime of a deep volcanic lake (Lake Bolsena, Central Italy)

Authors: Rosario Mosello, Piero Bruni, Michela Rogora, Gabriele Tartari, Claudia Dresti

PII: S0075-9511(18)30015-X
DOI: https://doi.org/10.1016/j.limno.2018.07.002
Reference: LIMNO 25650

To appear in:

Received date: 24-1-2018
Revised date: 11-7-2018
Accepted date: 14-7-2018

Please cite this article as: Mosello R, Piero B, Michela R, Gabriele T, Claudia D, Long-term change in the trophic status and mixing regime of a deep volcanic lake (Lake Bolsena, Central Italy), *Limnologica* (2018), https://doi.org/10.1016/j.limno.2018.07.002

Long-term change in the trophic status and mixing regime of a deep volcanic lake (Lake Bolsena, Central Italy)

Authors: Rosario MOSELLO [a, *], Piero BRUNI [b], Michela ROGORA[a], Gabriele TARTARI[a], Claudia DRESTI[a]

[a] National Research Council - Institute of Ecosystem Study, Largo V. Tonolli 50, 28922 Verbania Pallanza (VB), Italy

[b] Associazione Lago di Bolsena, Via Bixio 10, 01010 Marta (VT), Italy

*Corresponding author: Rosario Mosello, tel. +39 0323518300, fax: + 39 0323446513, e-mail address: r.mosello@ise.cnr.it

Number of tables: 3

Number of figures: 8

Abstract

Lake Bolsena, the fourth Italian lake for volume ($9.2 \cdot 10^9$ m^3), must be considered as highly sensitive to eutrophication for its extremely long water renewal time. In this paper, temperature and chemical characteristics of the lake measured in the period 2003-2017 are used to discuss the mixing pattern and the variation in the oxygen and algal nutrient concentrations, as indicators of the trophic level. In the analysed period the lake showed oligomictic characteristics, reaching the full overturn, with homogenization of the chemical profile over the whole water column, only in 4 out of the 15 considered years. A regular decrease of oxygen and increase of phosphorus concentrations in the deepest layers has been observed in the non-circulating multi-year periods. The mean total phosphorus concentration showed a regular increase, reaching values close to 16 µg P L^{-1} in early