

Lakes: The Mirrors of the Earth

BALANCING ECOSYSTEM INTEGRITY AND HUMAN WELLBEING

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Book of Abstracts of the 15th World Lake Conferences

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ROAD DE-ICING SALT AND ITS EFFECTS ON SURFACE WATER: A CASE STUDY IN NORTHERN ITALY, SUBALPINE LAKE DISTRICT

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In the recent period there has been a growing concern about the effects of increasing chloride concentration in surface waters, due to their potential damage to aquatic life. Increasing content of chloride has been observed in several lakes and rivers in urban areas or close to major roads in Europe and US. In Italy the use of NaCl as road de-icing agent is limited to northern regions and mountain areas. However, possible effects of chloride on water quality have never been assessed. Long term series of chemical data exists, including major ions, for the lakes of the subalpine district (Maggiore, Lugano, Como, Iseo e Garda). In this paper we analyse trends affecting Cl and Na concentrations in the deep subalpine lakes during the last 25 years, with the aim to discuss the possible causes of temporal changes. An in-depth analysis is presented for Lake Maggiore. All the lakes considered show positive trends of Na and Cl concentrations, mostly evident in the recent part of the record (since 2000). For Lake Maggiore, the increasing content of these ions in lake water is in agreement with the raising loads from the main tributaries. The use of NaCl as road de-icing agent in winter was identified as the main cause for the observed trends. Cl concentrations in the study lakes are still far from the threshold limit for water quality; however, the positive trends of Cl in these lakes, representing almost 80% of the total freshwater volume in Italy, warrants further investigation.

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