



Increasing the quality, comparability and accessibility of phytoplankton species composition time-series data



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ABSTRACT

Phytoplankton diversity and its variation over an extended time scale can provide answers to a wide range of questions relevant to societal needs. These include human health, the safe and sustained use of marine resources and the ecological status of the marine environment, including long-term changes under the impact of multiple stressors. The analysis of phytoplankton data collected at the same place over time, as well as the comparison among different sampling sites, provide key information for assessing environmental change, and evaluating new actions that must be made to reduce human induced pressures on the environment. To achieve these aims, phytoplankton data may be used several decades later by users that have not participated in their production, including automatic data retrieval and analysis. The methods used in phytoplankton species analysis vary widely among research and monitoring groups, while quality control procedures have not been implemented in most cases. Here we highlight some of the main differences in the sampling and analytical procedures applied to phytoplankton analysis and identify critical steps that are required to improve the quality and inter-comparability of data obtained at different sites and/or times. Harmonization of methods may not be a realistic goal, considering the wide range of purposes of phytoplankton time-series data collection. However, we propose that more consistent and detailed metadata and complementary information be recorded and made available along with phytoplankton time-series datasets, including description of the procedures and elements allowing for a quality control of the data. To keep up with the progress in taxonomic research, there is a need for continued training of taxonomists, and for supporting and complementing existing web resources, in order to allow a constant upgrade of knowledge in phytoplankton classification and identification. Efforts towards the improvement of metadata recording, data annotation and quality control procedures will ensure the internal consistency of phytoplankton time series and facilitate their comparability and accessibility, thus strongly increasing the value of the precious information they provide. Ultimately, the sharing of quality controlled data will allow one to recoup the high cost of obtaining the data through the multiple use of the time-series data in various projects over many decades.

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1. Introduction

Phytoplankton time-series (PTS) data are important to assess the ecological health and status of water bodies and changes occurring under climatic and anthropogenic pressures. When

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