

**MATHEMATICAL SIMULATION OF BIOLOGICAL ACTIVITY
IN LAKE BOURGET (FRANCE)**

N. ZERVOS*, B. TASSIN*, B. VINÇON-LEITE*, K. HADJIBIROS**

* CEREVER, Centre d'Enseignement et de Recherche sur l'Eau, la Ville et
l'Environnement, École Nationale des Ponts et Chaussées, France

** Department of Water Resources, Hydraulic and Maritime Engineering, Faculty of Civil
Engineering, National Technical University of Athens, Greece

ABSTRACT

Modelling phytoplankton activity is necessary for predicting water quality evolution in a lake. An initial modelling attempt is conducted on a large deep sub-alpine lake (Lake Bourget, Savoy, France), where several categories of unicellular organisms, including potentially toxic Cyanobacteria, are examined. A biogeochemical model is developed and coupled to an existing one-dimensional thermal model. A first calibration is performed, using data issued by measuring campaigns on 1995 and 1996; it is afterwards checked for years 1997 and 1998. The calibration is satisfactory with regard to 2 major criteria: (1) the interannual differences of planktonic successions are fairly well represented, and (2) the orders of magnitude of algal groups' biomass are correct. Nevertheless, this preliminary calibration must be improved as important divergences between model and data persist: a time lag during organisms' growth and uncertainty regarding prediction of population peaks of a specific species category.