

Sensitivity analysis with a phosphorus diagenesis model (SPIEL).- Ecological Modelling 190: 87-98

Abstract

Sensitivity analysis is an important part of the modelling procedure. In this paper, sensitivity analysis of a phosphorus diagenesis model (SPIEL) was used for determining the most important parameters and forcing functions, as well as the potential influence of technical in-lake measures on phosphorus (P) release from the sediment. SPIEL includes sub-modules for calculating the aerobic layer thickness, the iron-sulphur cycle, and the free aluminium sorption capacity. The results of a detailed sensitivity analysis for different module combinations were compared. By means of graphical representation of the cause and effect chains, the synergistic and compensatory effects of different processes on P release in Lake Sempach were discussed. The importance of the iron-sulphur cycle and of the aerobic layer thickness for the P release in this lake is demonstrated.