Long-term processes and regulation in the flood-relief channel New Danube in Vienna (Austria) – current position and proposals for management control strategies

H. Weilguni

With 9 figures and 3 tables in the text

Abstract: The New Danube, a man-made flood-relief bypass channel alongside the River Danube in Vienna, is intended to serve manifold purposes: the most important of these are flood control, recreation, drinking water supply, and providing a groundwater supply to the hinterland on the left bank of the channel. An 11-year study clearly shows the close interdependency of water quality between the River Danube, the two impoundments of the New Danube, and the underground aquifer of Danube Island – a narrow, artificially constructed island separating the channel from the main river. As a key chemical factor in the New Danube, phosphorus is evaluated and used for predicting future trends and maintenance of water quality. Biomass of aquatic macrophytes is an important factor in controlling phosphorus concentrations and maintaining trophic status in the two impoundments; careful management of the macrophytes is therefore crucial.

Introduction

The water quality of the bypass system New Danube is of broad popular interest in Vienna because of its recreational value for the citizens (cf. Humpesch et al. 2000). Therefore local government initiated a water quality monitoring program which has shown that the new channel system is comprised of three main interdependent components (Fig. 1): the River Danube as the main nutrient source (Weilguni et al. 2000), the aquifer of Danube Island which acts as a transition and transformation zone (Kreuzinger & Matsché 2000) and the New Danube itself as a processing zone (Dokulil & Janauer 2000; Janauer & Wychera 2000).

A hydroelectric power plant was constructed between 1992 and 1998 in the southern part of Vienna at Freudenau, and a barrage across the Danube in-