Geophysical Research Abstracts, Vol. 9, 10308, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-10308

Agriculture and aquatic Biodiversity – Impacts of Land-use Changes on the Suitability of European Freshwater Lakes for Conservation

T. Sauer

(1) Research Unit Sustainability and Global Change, Hamburg University, Germany, (2) Centre of Marine and Atmospheric Sciences, Germany (timm.sauer@zmaw.de / Phone: +49 40-42838-4121)

In this study I present a tool to assess current and future potentials of European freshwater lakes for aquatic conservation within an economic land-use model.

Climate change may alter agronomic potentials and ecosystem properties. Consequently crop patterns and species distribution may shift. Population growth and adaptation to global change will additionally influence land-use decisions and water demand. Water quality affects human health as well as biodiversity, which stabilizes essential environmental flows, but in turn is threatened by anthropogenic land-use.

Within this work interrelations between land-use and aquatic biodiversity are investigated, including their competition for resources. Agricultural decisions based on the respective political, economic, and biophysical environment are given by the FASOM model. Estimated agronomic nutrient loads are connected to lake attributes, and quantitative changes in stratification, trophy, and gas concentrations are modelled. Future simulations of land-use and lake properties are enabled by a GCM coupling. Thus habitat suitability for selected ecological targets can be derived under different climate and land-use scenarios.

The aim is to reveal conservation values of lakes in a dynamic context, considering issues of aquatic protection and aspects of food security. The linkage of land-use policies and their implications for the aquatic environment may also help in finding integrative strategies for managing water resources.