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中文题名	水沙变化对洞庭湖浮游生物的影响研究
英文题名	Study on the Influence of Water and Sediment Changes on the Plankton in Dongting Lake
中文关键词	洞庭湖, 浮游生物, 生态模拟, AQUATOX 模型
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中文文摘	<p>洞庭湖位于长江南侧，湖南省北部，是我国重要的淡水湖泊。湖区内拥有十分丰富的生态资源，是天然宝贵的物种资源库，也是国家级自然保护区。维护洞庭湖地区的生态安全对于保持湖区内的生物多样性以及维系下游地区的生态有着十分重要的意义。洞庭湖的入湖径流主要有两大部分构成：长江分流而来的松滋、虎渡、藕池等荆南三河以及湘江、资江、沅江、澧水等“四水”水系。这些入湖径流在经过湖区的调蓄作用后，在七里山附近汇入长江干流。作为典型的通江湖泊，三河和“四水”的来水来沙对于洞庭湖内的生态有着重要的影响。建国以来，上游地区水利工程的修建及水土保持工程使得洞庭湖的入湖水沙条件发生的显著的变化，这进一步影响到了湖区内的生态状况。本文以 AQUATOX 水生态模型为基础，利用河网模型提供的边界条件，探讨了洞庭湖各个湖区的浮游生物在入湖水沙条件变化情况下的生态响应。结果表明，在入湖径流含沙量持续降低的情况下，洞庭湖的浮游植物与浮游动物的生物量均将呈现出上升趋势。当入湖径流的含沙量降低至正常平水年的 30% 的水平时，各个湖区浮游植物的年均生物量上升约 15%~25%，浮游动物的年均生物量上升约 10%。使用基于叶绿素 a 的营养状态指数对于各个湖区的营养状况进行评估，当洞庭湖入湖径流含沙量降低时，东洞庭湖和西洞庭湖将面临较为严峻的富营养化风险。</p>
外文文摘	<p>Dongting Lake is located on the south side of the Yangtze River, composed of many lake areas in the northern part of Hunan Province. It has rich freshwater resources and ecological resources. It is an important aquatic species resource bank and a national nature reserve in China. Maintaining the ecological security of the Dongting Lake area is very important for maintaining the biodiversity in the lake area and the ecology of the downstream area. The inflows into Dongting Lake is mainly composed of two major components: Jingnan Three Rivers (diverged from the Yangtze River) and the "Four Rivers" (Xiang, Zi, Yuan and Li rivers). The inflow of the Three Rivers and the "Four Rivers" flows into the main stream of the Yangtze River near Chenglingji through the regulation and storage of Dongting Lake. As a typical river-connected lake, the incoming water and sediment from the Three Rivers in Jingnan and the "Four Rivers" have an important impact on the ecology of Dongting Lake. Since the founding of China, the construction of water conservancy projects and water and soil conservation projects in the upstream area have caused significant changes in the water and sand conditions of Dongting Lake, which has further affected the ecological conditions in the lake area. Based on the AQUATOX aquatic ecological model, this paper uses the boundary conditions provided by the river network model to explore the ecological response of plankton in each lake area of Dongting Lake under the reduced sediment content of the rivers entering the lake. The results show that the biomass of phytoplankton and zooplankton in Dongting Lake will show an upward trend under the condition that the sediment content of rivers entering the lake continues to decrease. When the sediment content of the river entering the lake drops to 30% of the normal level of normal water years, the average annual biomass of phytoplankton in each lake area will increase by about 15% to 25%, and the average annual biomass of zooplankton will increase by about 10%. The nutritional status index based on chlorophyll a is used to evaluate the nutritional status of each lake area. When the sediment content of the rivers entering Dongting</p>

	ng Lake decreases, East Dongting Lake and West Dongting Lake will face a more severe eutrophication risk.
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