

## 北方河流动态水环境容量分析与计算

姜欣, 许士国, 练建军, 孟庆国

大连理工大学建设工程学部水环境研究所

## Analysis and Calculation of Dynamic Water Environmental Capacity of Rivers in North China

JIANG Xin, XU Shi-Guo, LIAN Jian-Jun, MENG Qing-Guo

Insittute of Water and Environmental Research, Faculty of Infrastructure Engineering, Dalian University of Technology

摘要

参考文献

相关文章

Download: [PDF \(1258KB\)](#) [HTML 1KB](#) Export: [BibTeX](#) or [EndNote \(RIS\)](#) [Supporting Info](#)

**摘要** 由于自然条件的季节变化, 水环境容量具有明显的时间动态特性, 在单一的设计水文条件下计算的水环境容量并不能反映这一变化。在阐明水环境容量时间动态特性的基础上, 提出一种动态水环境容量的计算方法, 主要是利用合适的水质模型, 在动态水文设计条件下, 计算河流功能区的水环境容量。以哈尔滨市阿什河为例, 利用丹麦DHI MIKE11软件, 构建哈尔滨阿什河西泉眼水库以下河段水量水质模型, 采用一维水环境容量模型计算功能区水环境容量。结果表明, 阿什河各功能区冰封期水环境容量要远远小于非冰封期。此外, 通过比较各月不同水文设计条件下水环境容量的大小, 得到各功能区每个月水环境容量的上下控制线, 可为阿什河污染物排放总量控制提供可行的参考。

**关键词:** 水环境容量 动态 阿什河 冰封期

**Abstract:** As a result of the succession of the four seasons in nature, water environmental capacity is obviously characterized by temporal dynamic. However, the use of a simple hydraulic design in calculating water environment capacity is unable to reflect the dynamic variation. Based on characterization of the temporal dynamic of the water environmental capacity, a new method, including a suitable water quality model and a dynamic hydraulic design, was put forth for calculating. Using this method, a numerical water quality model was established with the aid of the hydrodynamic (HD) & advection-dispersion (AD) module of the DHI MIKE11 software for the downstreams of the Ashi River after the Xiquanyan Reservoir in Harbin. Water environmental capacities of its various function zones were worked out using the one-dimensional water environmental capacity model. Results show that the COD and  $\text{NH}_3\text{-H}$  water environmental capacities of various function zones were much lower in the the frozen period (from November to next March) than in the non-frozen period (from April to October). Furthermore, by the comparison between months and between various hydraulic conditions in water environment capacity, both the maximum and minimum water environmental capacity control lines were obtained for every function zone every month, which may serve as reference for total volume control of pollution discharge in the Ashi River.

**Keywords:** water environmental capacity dynamic Ashi River frozen period

Received 2012-12-05; published 2013-07-25

Fund:

国家自然科学基金 (51279022); 国家重点基础研究发展规划 (2013CB430403)

Corresponding Authors: 许士国 大连理工大学建设工程学部水环境研究所 Email: [sgxu@dlut.edu.cn](mailto:sgxu@dlut.edu.cn)About author: 姜欣 (1988-), 男, 山东临沂人, 博士生, 主要研究方向为水环境污染控制。E-mail: [xinjiang@mail.dlut.edu.cn](mailto:xinjiang@mail.dlut.edu.cn)

引用本文:

姜欣, 许士国, 练建军, 孟庆国. 北方河流动态水环境容量分析与计算[J] 生态与农村环境学报, 2013, V29(4): 409-414

JIANG Xin, XU Shi-Guo, LIAN Jian-Jun, MENG Qing-Guo. Analysis and Calculation of Dynamic Water Environmental Capacity of Rivers in North China[J] Journal of Ecology and Rural Environment, 2013, V29(4): 409-414

## Service

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ Email Alert
- ▶ RSS

## 作者相关文章

- ▶ 姜欣
- ▶ 许士国
- ▶ 练建军
- ▶ 孟庆国