珠江流域岩石风化作用消耗大气/土壤CO_2量的估算

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作者	单位	E-mail
覃小群	中国地质科学院岩溶地质研究所;国土资源部/广西岩溶动力学重点实验室	qxq@karst.ac.cn
刘朋雨	中国地质科学院岩溶地质研究所;广西师范学院	
黄奇波	中国地质科学院岩溶地质研究所;国土资源部/广西岩溶动力学重点实验室	
张连凯	中国地质科学院岩溶地质研究所;国土资源部/广西岩溶动力学重点实验室	

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中文摘要:以流域的岩性、径流量和水化学分析数据为主要资料, 利用基于GIS空间分析的GEM-CO_2模型, 估算珠江流域陆地岩石风化作用消耗大气/土壤空气中的CO_2, 评价河流流域的碳汇能力。结果表明, 珠江流域因岩石溶蚀和风化作用消耗大气/土壤中的CO_2量为252×109 mol?a^{-1} (571×103 mol?km^{-2}?a^{-1}), 从岩性分析, 碳酸盐岩区大气/土壤CO2消耗量为180×109 mol?a^{-1} (1030×103 mol?km^{-2}?a^{-1}), 占总量的71.4%。二级流域以西江流域CO_{222}

中文关键词:碳汇 二氧化碳 珠江流域

Estimation of Atmospheric/Soil CO_2 Consumption by Rock Weathering in the Pearl River Valley

Abstract:The atmospheric/soil CO_2 consumption by rock weathering has become the main carbon sink. The flux of CO_2 consumed by rock weathering increases with the increasing carbonate rock outcrop area and the water drainage intensity. In this paper, with the rock, water runoff and water chemistry data of the valley as the main data, the authors estimated the flux of atmospheric/soil CO_2 consumed by chemical erosion of continental rocks in the Pearl River Valley based on a global erosion model (GEM-CO_2) developed by Amiotte Suchet. The total carbon consumption is about 252×109 mol?a^{-1} (571×103 mol?km^{-2}?a^{-1}), about 71.4% of which are caused by carbonate rocks, with about 180×109 mol?a^{-1} (1030×103 mol km^{-2}?a^{-1}) CO_2 consumed flux. About 79.4% of the consumption of CO_2 is localized in Xijiang tributary basin, because of a high proportion of carbonate rocks and high humidity in this area. In contrast, the Beijiang tributary basin and the Dongjiang tributary basin only possess 13% and 4.9% of the total CO_2 consumption amount respectively. The flux of atmospheric/soil CO_2 consumed in the Pearl River Valley is 2.3 times higher than the average CO_2 consumption of the major river basins in the world.

keywords:carbon sink carbon dioxide the Pearl River Valley