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采矿活动和气候变化对煤矿区生态环境损失的影响

Effects of mining activity and climatic change on ecological losses in coal mining areas

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中文摘要:

系统评价煤矿区生态环境损失驱动因素的相对作用力,对矿区土地资源配置和生态环境治理具有重要指导作用。该文从生态学的角度,以徐州矿区为例,选择植被净初级生产力作为统一气候变化和采矿活动对矿区生态环境损失的衡量指标,通过该指标实现气候变化和采矿活动对矿区生态环境损失的可比性。研究表明:1)矿区植被净初级生产力NPP变化是气候因素和采矿因素综合作用的结果,气候变化对NPP的影响范围为0.111~3.333 g/(m²·月)(以每月每平方米植被生产的C计)之间,采矿活动对NPP影响的范围为90.525~107.892 g/(m²·月),采矿活动对NPP的影响大于气候变化对NPP的影响,NPP变化对采矿活动具有敏感性。2)气候变化推动NPP是向正向发展,采矿活动推动NPP向负向发展。1987-1998年采矿活动是推动NPP变化的主导因素,1998-2005年气候变化是推动NPP变化的主导因素,2005-2008年采矿活动成为推动NPP变化的主导因素,同时,随着采矿活动的加剧,采矿活动对NPP推动变成主导因素,并且推动NPP向负向发展的比例在增大。3)在采矿活动破坏区内,采矿活动对矿区生态环境的影响具有主导作用,主要表现为耕地NPP的大幅下降,通过土地复垦措施增加林地的NPP,可改变矿区生态环境的发展方向;在采矿活动的影响区内,气候变化对生态环境的影响具有主导作用。

英文摘要:

It is of an important guiding meaning for making the planning of the exploitation of mineral resource and ecological environment improvement to evaluate the relative effect of ecological environmental loss in mine regions. From view of ecological point, the study selected NPP as the measuring indicator to unify the impacts of climate change and mining activities on the losses of ecological environment in mining areas. Through the indicator it achieved the comparability of the impacts of climate change and mining activities on the loss of ecological environment in mining areas. The results showed that: 1) Net primary productivity of vegetation (Net Primary Productivity) in the mining was the result of the comprehensive effect of climate factors and mining factors, the impact of climate change on NPP ranged from 0.111 to 3.333 g/(m²·mon) and the impact of mining activities on NPP ranged from 90.525 to 107.892 g/(m²·mon). The impact of mining activities on NPP was greater than that of climate change on NPP and NPP was sensitive to the changes of mining activities. 2) Climate change promoted NPP change towards the positive direction, mining activities promoted NPP change towards both positive and negative direction. In 1987-1998, mining activity was the dominant factor for promoting NPP change; In 1998-2005 climate change was leading factor for promoting NPP change, and in 2005-2008 mining activity became the dominant factor for promoting NPP change. At the same time, as the impact of mining activities increased, the effect of mining activities turned out to be the leading factor, and the proportion of NPP change to the negative direction increased. 3) In the mining destruction region, the impact of mining activity played a decisive role in the ecological environment, it was showed by the NPP decrease of crop land. Through taking ecological reclamation measures, the ecological environment can be improved with the NPP increase of woodland. In the mining impact region, the impact of climate change on NPP plays a decisive role.

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