基于 PLUS-InVEST 模型的江苏省苏南地区生态系统服务功能时空演变及预测分析

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摘要：【目的】分析土地利用变化对区域生态系统服务功能的时空变化的影响。【方法】本研究以江苏省南部为研究对象，基于土地利用数据，使用 InVEST 模型对 2000-2020 年碳储量和生境质量进行研究；利用 PLUS 模型模拟研究区 2030 年自然发展情景、耕地保护情景和生态保护情景下的土地利用变化，分析不同土地利用政策对生态系统服务功能的影响。【结果】2000-2020 年苏南地区地利用变化以建设用地侵占耕地和其它用地类型为主还造成生境质量的退化和总碳储量的减少，其中，高碳储量和高生境质量区域都处于人类活动不密集的山林地，低生境质量和低碳储量从各市中心向外辐射分布；基于 PLUS 模型结果显示，耕地保护情景和生态保护情景对比自然发展情景，可以遏制建设用地扩张，减少土壤碳储量的损失和控制低生境质量面积的扩张。【结论】为规划者提供决策依据，在苏南地区国土空间规划时，可参照耕地保护和生态保护情景，加强耕地保护和森林保护，科学合理进行城市建设从而推动城市高质量可持续发展。
关键词：土地利用；苏南地区；InVEST 模型；PLUS 模型；

Spatio-temporal evolution and prediction of ecosystem service function in southern Jiangsu Province based on PLUS and InVEST models

Abstract: 【Objective】 In order to analyze the effects of land use change on temporal and spatial changes of regional ecosystem service function,. 【Method】This study took southern Jiangsu Province as the research object. Based on land use data, the InVEST model was used to study carbon storage and habitat quality during 2000-2020. The PLUS model was used to simulate the land use change under the natural development scenario, cultivated land protection scenario and ecological protection scenario in the study area in 2030, and the impact of different land use policies on ecosystem service functions was analyzed. 【Result】The results show that the land use change in southern Jiangsu from 2000 to 2020 is dominated by the encroachment of construction land into cultivated land and other land types, which will also lead to the degradation of habitat quality and the reduction of total carbon stocks. Among them, the areas with high carbon stocks and high habitat quality are located in the mountain forest land where human activities are not intensive, and the areas with low habitat quality and low carbon stocks radiate from the city centers. The results based on the PLUS model show that compared with the natural development scenario, the cultivated land protection scenario and ecological protection scenario can curb the expansion of construction land, reduce the loss of soil carbon storage and control the expansion of low-habitat area. 【Conclusion】The research results can provide decision-making basis for planners. In the territorial spatial planning of southern Jiangsu, we can refer to the scenarios of cultivated land protection and ecological protection, strengthen cultivated land protection and forest protection, and carry out scientific and reasonable urban construction so as to promote high-quality and sustainable urban development.
Key Words： Land use；Southern Jiangsu ; InVEST Model; PLUS Model