

## 基于BP神经网络模型的平潭岛植被景观模拟

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Simulation of vegetation landscape in Pingtan Island based on BP neural network model.

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**摘要** 以GIS为技术平台, 利用Matlab 7.0, 选用2 km×2 km网格图对平潭岛植被景观进行切割, 得到50个样方数据, 其中, 44个用于模型训练, 6个用于模型检验, 在此基础上, 选取分维数、Shannon多样性指数、蔓延度指数作为模型输出数据, 选取居民点个数、风速和距海边距离作为影响因素, 建立平潭岛植被景观的BP神经网络模型, 并进行误差检验. 结果表明: 影响平潭岛植被景观空间格局和植被多样性状况的主要因素为风速、距海岸距离, 人为因素对研究区植被景观的空间连接程度造成较大影响. BP神经网络模型对研究区植被景观与环境及人为影响因子之间关系的拟合与实际情况基本吻合, 平均误差为7.4%, 最小误差仅0.2%, 模型模拟误差较小, 拟合度较高, 可用于对研究区植被景观的定量预测模拟.

**关键词:** [神经网络](#) [植被景观](#) [GIS](#) [Matlab](#) [平潭岛](#)

**Abstract:** Taking GIS as technical platform and by using Matlab 7.0, the vegetation landscape in Pingtan Island was cut with 2 km×2 km grid graph. The data of 50 quadrats were obtained. Forty-four of the 50 quadrates were used for model training, and the rest 6 were used for model checking. Fractal dimension, Shannon diversity index, and contagion index were selected as output data of the model, and the number of residential quarter, wind speed, and the distance from the coast were chosen as affecting factors. A BP neural network model of vegetation landscape in Pingtan Island was established, and was checked by error test. The results demonstrated that the major factors affecting the vegetation landscape spatial pattern and diversity in Pingtan Island were wind speed and the distance from the coast, and anthropogenic factors had greater effects on the spatial connection of vegetation landscape. The fitted results of the relationships between vegetation landscape and environmental and anthropogenic factors were basically accorded with the truth. The average error was 7.4%, and the minimum error was 0.2%, indicating that the model could be applied to quantitatively predict and simulate the vegetation landscape in Pingtan Island.

**Key words:** [neural network](#) [vegetation landscape](#) [GIS](#) [Matlab](#) [Pingtan Island](#)

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