海岸带资源开发与环境

# 基于BP网络研究城市扩张中的道路因素:以张家港市为例

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摘要　　结合GIS和BP神经网络等方法，将多幅TM遥感影像和土地利用图栅格化和数字化，抽取了道路距离、NDBI（归一化建筑指数）和NDVI（归一化植被指数）等影响因子，利用BP神经网络仿真了张家港市城市扩张侵占农用地的变化规律，以定量描述城市化过程中道路对农用地的影响. 结果表明：距道路约500 m内的农转非概率高达12%，道路对周边农地减少的影响最远辐射至2 000 m处；-0.3<NDBI<0.5时，距道路越近，农地越容易转化为建筑用地；同时，BP网络易陷入局部极小点的缺陷可以通过增加BP网络训练点来避免.

关键词　　人工神经网络；归一化建筑指数；归一化植被指数；城市扩张

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# Research of road factors in urban expansion based on BP network: A case study of Zhangjiagang city

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**Abstract**

　This paper picked up the impact factors of road distance, NDBI (Normalized Difference Build　up Index), NDVI(Normalized Difference Vegetation Index) and so on by means of analyzing the TM RS images and land use map digitally in Zhangjiagang city. In order to figure the effect of road to cropland in urbanization quantificationally, BP ANN (Back Propagation Artificial Neural Networks) was used to simulate the process of invasion and occupation of urban expansion in Zhangjiagang city. The results indicated that the probability of change from cropland to urban increased as high as 12% inside the range of 500 m around the road, and the impact of road to surrounding cropland reach the farthest to 2 000 m away. When -0.3<NDBI<0.5,the cropland neighboring the road was more easily transformed to urban. Finally, increasing training points of BP ANN could avoid the network to get into local minimum point defects.

**Key words**　 artificial neural network (ANN)　NDBI (normalized difference build　up index)　NDVI (normalized difference vegetation index)　urban expansion

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