Correlation Analysis Between Shipyard Production Status And Coastal Water Quality Based On Multi-temporal Remote Sensing Data

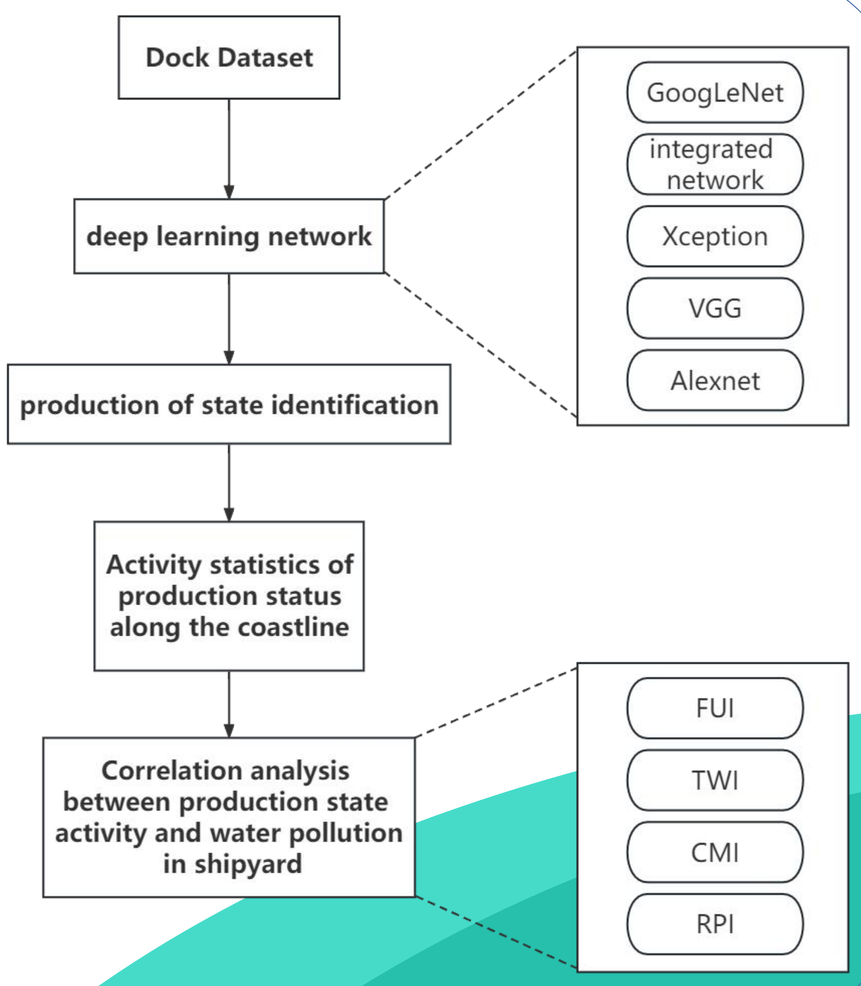
Wanrou Qin, Yuhong Tu, Yan Song

Organisation(s): China University of Geosciences (Wuhan), China, People's Republic of

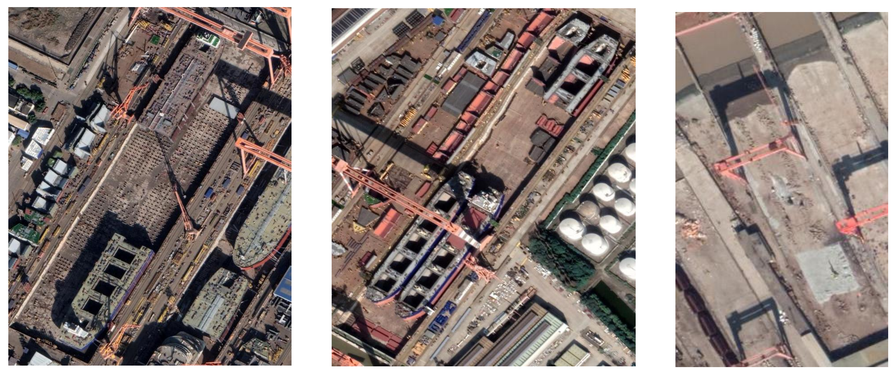
ABSTRACT

As an important place for shipbuilding enterprises to manufacture and repair ships, docks and berths are the most critical components of shipbuilding enterprises.In the shipyard scene, the dock and berth are closely related to the production status of the shipyard. They are the core land types in the shipyard production status monitoring. Therefore, the production status of the shipyard can be inferred by monitoring the dock and berth in the satellite remote sensing image.In this paper, based on the characteristics that shipyards with different production states differ greatly in remote sensing images, five deep learning networks (GoogLeNet, integrated network, Xception, VGG and Alexnet) are used to train and predict the dock data set, and the accuracy and effect of the evaluation model are compared. Then, combined with the shipyard vector data, the production state activity of the shipyard 3km along the coastline is counted. The experiment adopts cross-time series statistics, and selects the areas with different production state activity across time series as the research area (the research area chooses to avoid factories and many housing construction areas). Finally, the Sentinel-2A image data of the selected study area in the cross-temporal period was obtained, and the water body was extracted by MNDWI. The water color index (FUI), turbid water index (TWI), cyanobacteria and macrophytes Index (CMI), river pollution index (RPI) were calculated to evaluate the water pollution situation, and the correlation analysis between the activity of the shipyard and the water pollution situation was established.

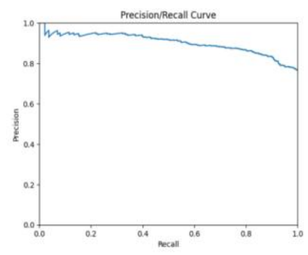
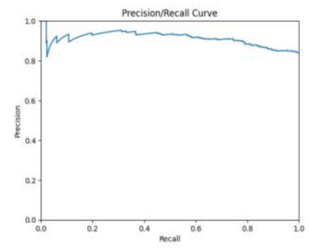
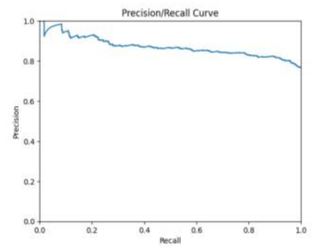
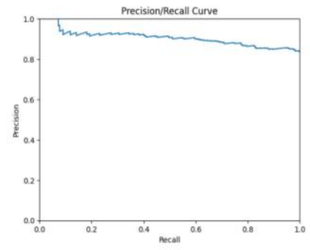
GENERAL FLOWCHART



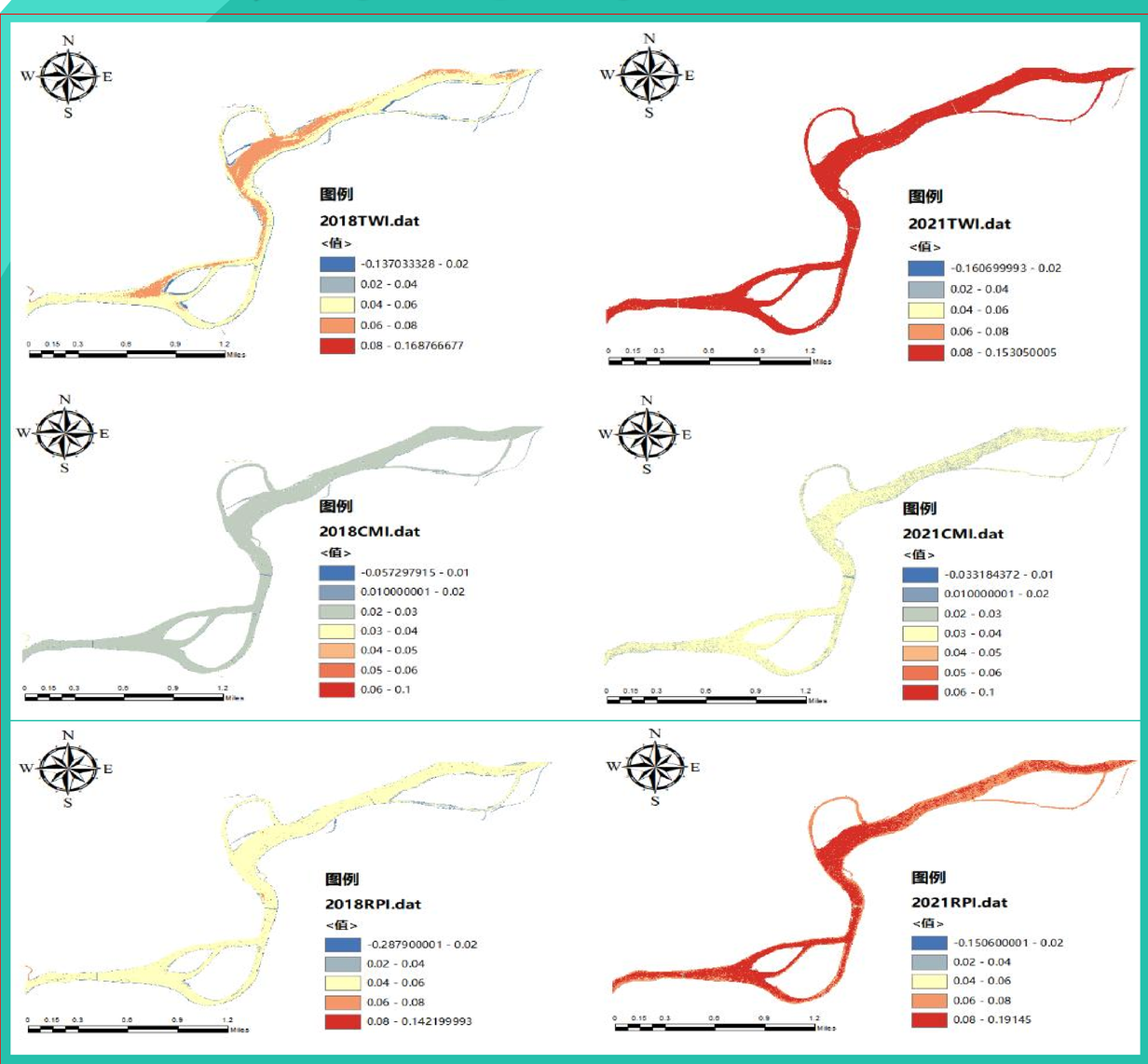
DOCK DATASET



DEEP LEARNING NETWORK

	pr curve	Average Precision
GoogLeNet		0.9023
Xception		0.8606
VGG		0.8705
Alexnet		0.8751

WATER POLLUTION



ACTIVITY STATISTICS

	statistical time	Production state activity
Study area 1	2021.10.29	6.7/km
	2018.03.13	0.3/km
Study area 2	2021.11.02	1/km
	2018.03.27	2/km