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**DOES ENVIRONMENTAL REGULATION IMPROVE MARINE  
ECO-EFFICIENCY? A PANEL DATA ANALYSIS OF SPILLOVER  
EFFECT OF MARINE INDUSTRY STRUCTURE UPGRADING IN  
CHINA****Abstract:**

The upgrading of marine industry structure is an important driving force for development of the marine ecological environment. With the increasing importance of marine economy, China has attached more attention to the ecological environment in coastal areas. To analyze the influence of marine industry structure upgrading (MISU) on marine ecology, this paper quantifies the impact of rationalization and elevation of marine industry on marine ecology for 11 provinces (or municipalities) in China's coastal areas. The Super-Efficiency Slacks-Based Measure (SE-SBM) model is used to illustrate the marine regional eco-efficiency considering undesired outputs. The results of the Spatial Durbin Model (SDM) regression support the impact of marine industry structure upgrading on the ecological environment varies in different regions. It is also verified upgrading of marine industry structure has a spatial spillover effect. During the upgrading process, income, urbanization and environmental regulation have various impacts on marine ecology. This paper puts forward policy suggestions for improving the eco efficiency of China's coastal areas from the perspective of marine industry development mode and provincial government cooperation. It also provides empirical support for policymakers when formulating environmental policies to realize marine ecological civilization.

**Keywords:**

ecological efficiency; marine industry structure upgrading (MISU); super-efficiency SBM model; spatial spillover effect, panel data

**JEL Classification:** E60, K32, Q00