

# Stable blue food supply can enhance the resilience of cropland ecosystem against the green food fluctuations shocks

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## Abstract

Global changes in diets and frequent natural disasters have induced food production fluctuations, posing challenges to food security. The importance of blue food is attracting unprecedented attention, but research on its role in connection with terrestrial food and its mechanism is currently not available, especially there are significant challenges in how to carry out systematic food research on land and sea integration. Human demand for marine blue food affects cropland ecosystem through the food system and drives changes in its function and causes the loss of food security, while the interactions between land-sea food system and the response of cropland ecosystem resilience to terrestrial and marine food production have not been systematically studied. This study assesses the resilience of cropland ecosystem in coastal China based on early warning signal indicators calculated from net primary productivity (NPP), and analyzes the situation of shocks to production in the land-sea food sector to reveal the impact of green-blue food production on the resilience of cropland ecosystem. The results demonstrate that the marine food fluctuation had a significant impact on the resilience of cropland ecosystem in coastal China. Fujian and Guangdong provinces of China observed a significant decrease in cropland ecosystem resilience, with  $\tau$  values of 0.27 and 0.07, respectively; the coefficient of variation of seafood production per capita as an essential influence on NPP resilience, with a contribution of 19.53%. The decoupling of blue food from green food in regions of increased cropland NPP resilience contributes to the land-sea food sector mutual complement through stable yields, and buffers the effects of food shocks on the resilience of cropland ecosystem. This study provides new perspectives on coordinating the balance between sustainable development of cropland ecosystem and human well-being.

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