

# Urban Spatial Expansion and its Effect on Island Ecosystem: A Case Study of the Island City of Xiamen, Southeast China

Lin Tao<sup>1\*</sup>

Zhao Qianjun<sup>1</sup>

Cui Shenghui<sup>1</sup>

Xue Xiongzhi<sup>2</sup>

Shi Longyu<sup>1</sup>

Gao Lijie<sup>1</sup>

Key Lab of Urban Environment and Health, Institute of Urban Environment  
Chinese Academy of Sciences, Xiamen, China 361021

\*E-mail Address: tlin@iue.ac.cn

Coastal and Ocean Management Institute  
Xiamen University, Xiamen, China 361005

Island, an indispensable part of coastal ecosystem, is facing increasing stress from urbanization in China. This paper takes Xiamen Island in the southeastern China as an example, describes its 100-year's urban spatial expansion by combining remote sensing images with historical survey data. A focus is given on the recent 30 years when Xiamen Island is developed as a special economic zone and experiences rapid urbanization process, the island's urban spatial expansion are analyzed by land user changes matrix and land use intensity index (LUII). Then, effects of urban spatial expansion on the island ecosystem are quantitatively studied for natural ecosystem service evaluation and landscape spatial pattern analysis. An objective oriented ecosystem service evaluation method is adopted to investigate variations in ecosystem services in response to land use changes during urbanization. Natural ecosystem eroded index (NEEI) and landscape separation index (LSI) are applied to detect the stress of urban area sprawl to the natural landscapes in the island.



23-27 November • Manila, Philippines

This paper looks into urban planning changes over the years in Xiamen and in what way it takes into consideration land and sea use planning to ensure a holistic and integrative approach in urban coastal planning. Conclusions/recommendations are expected to provide helpful insights on rational development of island ecosystems with consideration to rapid urbanization.