

# ABSTRACT

## Emergy value maps as a decision support tool for marine spatial planning in Korea

Daeseok Kang<sup>1</sup>, Naryeong Kim<sup>1</sup>, Jongseong Ryu<sup>2</sup>, and Jungho Nam<sup>3</sup>  
<sup>1</sup>Pukyong National University, <sup>2</sup>Anyang University, <sup>3</sup>Korea Maritime Institute

Marine spatial planning (MSP) has become one of the main management tools for marine ecosystems and resources in Korea with the enforcement of the Marine Spatial Planning and Management Act in April 2019. A key component of the marine spatial planning framework under development in Korea is the valuation of marine ecosystem services to provide information that can be used to resolve conflicts among different uses and make decisions on the use and conservation of marine ecosystems and resources. Emergy methodology has been included as one of the valuation tools in the framework along with the preference-based approaches to provide information for better spatial decisionmaking from different perspectives. The emergy methodology that is a biophysical approach in the valuation of ecosystem services can contribute much to the development of the Korean MSP framework by providing value maps for marine ecosystem services. In the emergy methodology, the value of a product or service is proportional to the sum of all inputs (energy, materials, information, labor, etc.), expressed in a reference energy (solar energy in the current practice), that were spent to produce it. This study attempts to construct value maps for the entire marine ecosystem of Korea using the emergy methodology that will aid the implementation of marine spatial planning. Classification of marine ecosystem services, construction of a database for unit emergy values (i.e., conversion factors to calculate emergy quantity from biophysical data), collection of data and information to quantify marine ecosystem services, and construction of emergy value maps have been carried out for selected marine areas. More work is needed, especially to fill the gaps in spatial biophysical data to quantify marine ecosystem services and construct the unit emergy value database that reflects the characteristics of the Korean marine ecosystem.

