Enhancing Significant Wave Height Forecasts for the East Coast of the Korean Peninsula Using a SWAN and Deep Neural Network Approach

The SWAN (Simulating WAves Nearshore) model is a third-generation spectral wave model designed to simulate wave propagation, generation, and transformation in coastal regions and inland waters. This study investigates enhancing the accuracy of significant wave height (SWH) predictions generated by the SWAN model for the east coast of the Korean Peninsula by integrating a deep neural network (DNN). By combining DNNs with SWAN outputs, we aim to achieve more precise SWH forecasts. The SWAN model's SWH results were produced using ERA-Interim wind data as input. The DNN leverages extensive historical wave data and additional parameters to learn complex patterns and improve forecast reliability. This hybrid approach offers a robust framework that combines the strengths of numerical modeling with advanced data-driven techniques, tailored specifically for the unique oceanographic conditions of the Korean Peninsula.

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