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## **Predicted mapping of bed sediments in the estuarine turbidity maxima of Yangtze River based on multibeam data**

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Predictive mapping of seabed sediments based on multibeam bathymetric (BM), and backscatter (BS) data is effective for mapping the spatial distribution of the substrate. The sediment samples were collected by the box dredge, and then measured and analyzed by the LS13320 produced by BECKMAN. Raw BM and BS were collected using a 200/400 kHz SeaBat 7125 multi-beam echo sounder system (MBES) (Teledyne Reson, Slangerup, Denmark) in the area of turbidity maximum zone (TMZ) of the Yangtze River Estuary (YRE). The raw BS was processed by the HIPS and SIPS 11.0 software. The raw BM was processed by the PDS 2000 software. We extract bedform features by the GRASS GIS version 7.6.1 (GRASS Development Team, Beaverton, OR, USA) from BM data. The bedform features were classified as plane, pit, ridge, channel, peak, and pass by Wood's Criteria, based on the adjusting the value of slope tolerance. The bedform features were classified as flat, pit, ridge, valley, peak, shoulder, spur, slope, hollow, and foot-slope by Geomorphons method. At last, a robust modeling technique, the random forest decision tree (RFDT), was used to predict the seabed sediments in the study area.