

## SEASONAL VARIATION OF SUSPENDED SEDIMENT CONCENTRATION AT THE YANGTZE ESTUARY - REMOTE SENSING OBSERVATION AND NUMERICAL SIMULATION

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### ABSTRACT:

The variation of surface suspended sediment concentration (SSC) is related to tidal conditions, winds, bathymetry, river discharge, and so on. It is very difficult to depict the averaged seasonal variations of SSC with the single in-situ or satellite observations due to the insufficient spatial temporal and spatial coverage. In this paper, utilizing both numerical model and remote sensing observations, we studied the variations of seasonally averaged SSC in the Yangtze Estuary of China and its adjacent coastal sea in 2010. Considering the tides, winds, and river inputs, a hydrodynamic model based on Delft3D was established to simulate the processes of sediment erosion, re-suspension, transport and deposition for the study area. The SSC maps derived from 11 MODIS images were used to tune the model and to analyze the distribution and variation of SSC. The water level outputs from the model are validated against the in situ tidal station data. The seasonally averaged SSC for the summer and autumn was much higher than that for the spring and winter in the Yangtze Estuary while SSC for the autumn was highest in the Hangzhou Bay. The offshore sediment plume (above 100 mg/L) was evident in the winter. In general, the MODIS-derived and model-simulated SSC maps agreed well. Furthermore, combining the statistics of winds, river discharge, and the modelled results (bed shear stress, currents, salinity), the dynamic mechanisms of the seasonal variation of SSC were discussed.

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