



Modeling of tidal effects on local meteorology in Gyeonggi Bay, West Sea of Korea

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In this study, the impact of coastal wetlands on local meteorology was evaluated using the Weather Research and Forecasting (WRF) meteorological model during summer 2016 (1500 UTC 18 August – 2100 UTC 20 August). The Gyeonggi Bay, which is located in the western part of the Seoul metropolitan area, is a large wetland region (35.2% of total Korea's coastal wetlands) with a large sea-level difference (8-10 m). Improved data for coastal wetland applications of the WRF model was obtained from Ministry of Oceans and Fisheries (MOF) and Korea Marine Environment Management Corporation (KOEM). The fractions of coastal wetlands occupy about 8% of total surface area (11,628 km²). The analysis was carried out by two sets of simulation experiments: (1) applied the water bodies land cover to coastal wetland grids assuming high tide and (2) applied the coastal wetland with improved land use parameter assuming tidal flat condition. Overall, moderate differences in most meteorological variables were shown at the sea adjacent to the coastal wetlands during afternoon (1600-1900 LST). In particular, the decreases (about 1-2°) in the near-surface temperature and the increases (1-3 g kg⁻¹) in the water vapor mixing ratio were predicted as the heat capacity increased (2.5×10^{19} times) during the high tide.

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