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# Carbon dioxide emission on the East-Siberian Sea in connection with hydrometeorological conditions

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It is usually assumed that surface waters of the Arctic seas absorb atmospheric carbon dioxide (CO2) during ice-free period because of low temperature and high seasonal primary productivity. However our multi-year study (1999-2007) shows that western part of the East-Siberian Sea (ESS) serves as a significant source CO2 to the atmosphere during summer and fall seasons. CO2 air-sea exchange was studied using difference of sea-air pCO2 values and Wanninkhof's relationships between fluxes and wind speed. Eddy correlation flux measurements made above the open water surface demonstrate that application of Wanninkhof cubic parameterization using hourly (or daily) average wind velocities is preferable for the calculation of CO2 fluxes in the ocean–atmosphere system on the ESS western shelf for the wind velocity range 3.6–9.3 m s–1. The major objective of the present study is to show connection among dynamics of the carbonate system and CO2 efflux to the atmosphere with hydrometeorological conditions and riverine runoff. It was found that intensity of the CO2 emission and position of change of CO2 flux direction in the ESS coastal zone depends mostly from prevailing atmospheric processes which determined interaction of different water masses and gas transfer velocity. Riverine runoff plays the secondary role on rates of CO2 evasion.