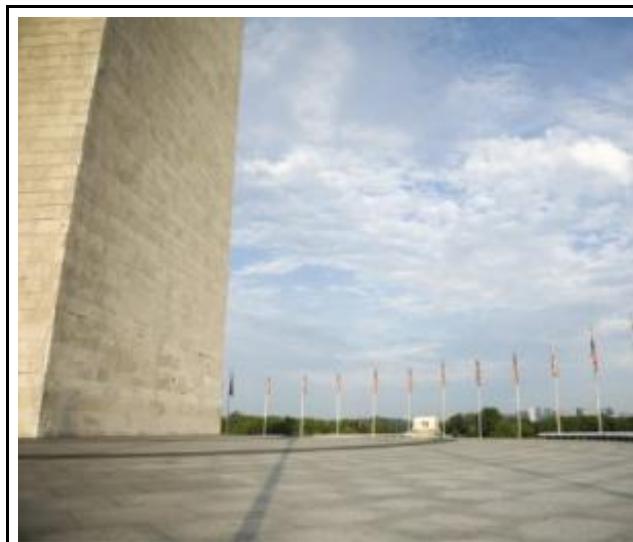


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Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.This TM consists of two chapters. Chapter I describes the development of a coupled, one-dimensional biogeochemical model using turbulence closure mixed layer (TCMLM) dynamics. The model is applied to the Sargasso Sea at the BATS (Bermuda Atlantic Time Series) site and the results are compared with a previous model study in the same region described in NASNTP-2001-209991. The use of the TCMLM contributed to some improvements in the model simulation of chlorophyll, PAR, nitrate, phosphate, and oxygen, but most importantly, the current model achieved good agreement with the data with much more realistic background eddy diffusivity. However, off-line calculations of horizontal transport of biogeochemical properties revealed that one-dimensional dynamics can only provide a limited assessment of the nutrient and carbon balances at BATS. Future studies in the BATS region will require comprehensive three-dimensional field studies, combined with three-dimensional eddy resolving numerical experiments, to adequately quantify the impact of the local and remote forcing on ecosystem dynamics and carbon cycling. Chapter II addresses the sensitivity of global sea-air CO₂ flux estimates to wind speed, temperature, and salinity. Sensitivity analyses of sea-air CO₂ flux to wind speed climatologies, gas transfer algorithms, SSS and SST were conducted for the global oceans and regional domains. Large uncertainties in the global sea-air flux are identified, primarily due to the different gas transfer algorithms used. The sensitivity of the sea-air flux to SST and SSS is similar in magnitude to the effect of using different wind climatologies. Globally, the mean ocean uptake of CO₂ changes by 5 to 16 , depending upon the combination of SST and SSS used.

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