

Abstract Submitted
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Air–water gas exchange in wave–free environments EVAN VARIANO, University of California, Berkeley, EDWIN COWEN, Cornell University, DAVID HO, University of Hawaii, VICTOR ENGEL, National Park Service — Field and laboratory experiments investigate the dynamics of gas exchange at natural water surfaces, focusing on those in which there is no surface shear due to wind. Laboratory results using quantitative imaging of both velocity fields and CO_2 concentration fields allow us to measure the conditional statistics of scalar flux due to subsurface–generated turbulence. Field measurements tracking a cloud of dissolved SF_6 gas through a patterned marshland allow us to determine the weekly–averaged interfacial gas transfer rate, which is dominated by thermal convection and rain–generated mixing. These results are used to evaluate potential models for predicting flux rates in such environments, which include many of the most ecologically productive habitats. Predicting these fluxes is an important foundation for ecological and biogeochemical research on these habitats.

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