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The influence of waves and turbulence on the heat flux at the surface of natural water bodies. FABRICE VERON, University of Delaware, W. KENDALL MELVILLE, Scripps Institution of Oceanography — The top few meters of the ocean play a key role in the in the surface fluxes of momentum, gas, heat and mass. The magnitude of these fluxes is strongly influenced by the dynamics of both air and water boundary layers. We present results of several field experiments on the kinematics of small-scale surface turbulence and surface waves, their influence on the surface skin layer, and the resulting transfers of heat across the diffusive layer at the surface of the ocean. A variety of optical and electro-mechanical instruments are used to measure the evolution of the surface velocity and temperature fields. These include visible and infrared imaging of the surface, thermal surface velocimetry, and fast-response thermometry. We show that at low wind speed, it is the small-scale turbulence at the surface of the ocean, rather than breaking waves that most influence and disrupt the surface skin layer. We find that at the low wind speed surface turbulence correlates with the surface heat flux. In addition, we find that and that the surface wave field modulates a component of the total air-sea heat flux.

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