Vertical mixing in the bottom boundary layer and pycnocline of the north Laptev Sea is evaluated from a rapidly sampled 12-h time series of microstructure temperature, conductivity, and shear observations collected under 100% sea-ice during October 2008. Observed bottom boundary turbulent kinetic energy dissipation was enhanced ($\sim 10^{-4}$ W m$^{-3}$) beyond background levels ($\sim 10^{-6}$ W m$^{-3}$), extending up to 10 m above the seabed when simulated tidal currents were directed on slope. Upward bottom boundary heat fluxes into the halocline-class waters peaked at $\sim 4-8$ W m$^{-2}$, resulting in $\sim 2$ W m$^{-2}$ 12-h average flux. An isolated 2-h episode of intense pycnocline dissipation ($\sim 10^{-3}$ W m$^{-3}$) was observed that was unaccounted for by localized wind events. Peak upward cross-pycnocline heat fluxes from the Arctic halocline were $\sim 54$ W m$^{-2}$, resulting in a $\sim 12$ W m$^{-2}$ average flux. Moored current meter observations from the central Laptev Sea near the $M_2$ critical latitude are consistent with mixing episodes are driven by pycnocline shear enhancement due to alignment between the rotating pycnocline shear vector and under-ice stress vector. These results highlight the intermittent nature of Arctic shelf sea mixing processes and how these can impact the transformation of important water masses. The observations also clearly demonstrate that absence or presence of sea ice profoundly affects the availability of near-inertial kinetic energy to drive vertical mixing on the Arctic shelves.