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Unmanned Aircraft for Mapping Atmospheric Boundary Layer Induced Geomorphological Changes VICTORIA NATALIE, JAMEY JACOB, Oklahoma State University — The process of acquiring lower atmospheric measurements onboard unmanned aircraft systems (UAS) is becoming a widely available solution. This study ties atmospheric observations using UAS with photogrammetrically mapped rapid geomorphology to observe and relate the terrain induced effects on lower atmospheric phenomena. Lower atmospheric boundary conditions are characterized through wind velocity and turbulence measurements. In order to achieve this data fusion, empirical data was obtained by UAS mounted anemometers and photogrammetric terrain modeling was acquired utilizing airborne imagery. The results of both are analyzed and related to compare the coupled effects. Wind induced terrain variations are also compared through multiple terrain models, showing the temporal evolution of the landscape. This study was performed at Little Sahara is a State park in Oklahoma, a naturally occurring collection of barchan structures and sand dunes that are heavily influenced by the prevailing southern wind. The datasets are months apart, and the changes in the topography demonstrate how closely linked the atmospheric movement and the changes in topography are to each other. Wind observations were made with multiple direct and indirect methods and are presented.

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