Title: Potential dust from diverse land-use types modifies phytoplankton communities across a shallow eutrophic lake, USA

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Abstract: Aeolian dust transport contributes to nutrient deposition in lakewater in the drylands of Utah, USA. Particle-associated microbial species and nutrients including nitrogen and phosphorus entrained in dust events may alter phytoplankton dynamics. Further, diverse land-use types from drylands may provide distinctive dust sources with characteristic nutrient profiles. We collected potential dust from six land-use designations (oil/gas, alfalfa agricultural, alluvial fan, degraded rangeland, playa, and Great Salt Lake) at sites known to contribute to dust events, and added the dust to lakewater in a five-day *in situ* experiment at Utah Lake, a shallow well-mixed basin located in Utah, USA. Great Salt Lake sites were of particular interest due to the lake's rapid drying in recent years and its unique lakebed composition which includes heavy metals such as arsenic and mercury. We analyzed subsequent shifts in water chemistry, chlorophyll-a, phycocyanin concentrations, and cyanobacterial communities. Phycocyanin and chlorophyll-a concentrations both showed variation ($p < 0.01$) due to dust source land-use type and time point. Total nitrogen showed a impact of dust source land-use type only ($p < 0.05$), while ammonium showed a impact of time point only ($p < 0.01$), and total phosphorus and nitrate showed impacts of both land-use type ($p < 0.01$) and time point ($p < 0.05$). Cyanobacterial species typical for Utah Lake at the time of the experiment included *Aphanocapsa*, *Dolichospermum, Merismopedia,* and *Aphanizomenon spp*. These results indicate that aeolian dust input may contribute to distinctive alterations of lakewater biogeochemistry which are time-dependent.