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Supporting Online Material for

Large Wind Shift on the Great Plains During the Medieval Warm Period

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This PDF file includes:

Figs. S1 to S4
References

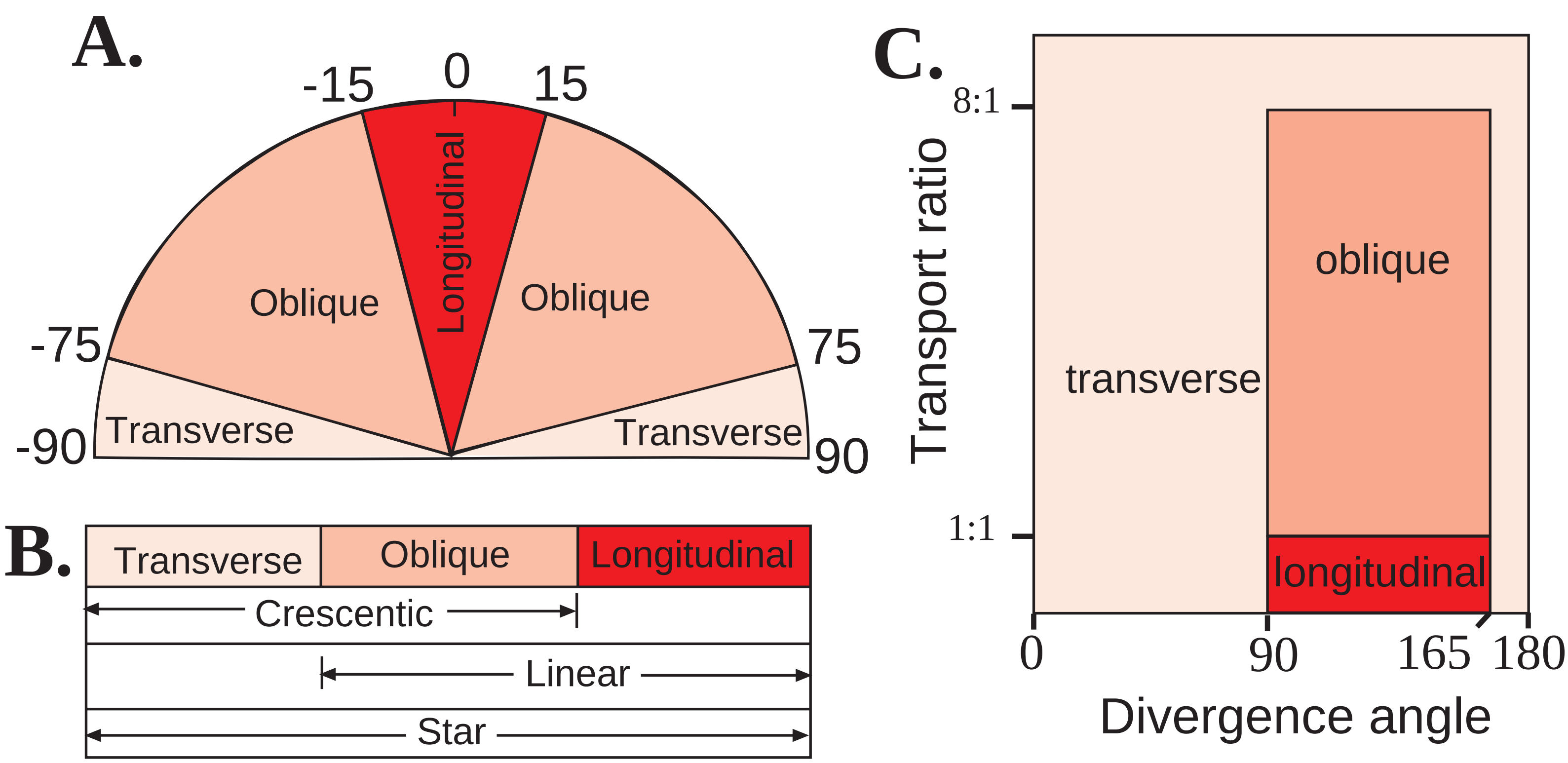


Fig S1. Dune types and wind regimes. A. Morphodynamic dune types based on angular relationship between dune trend and resultant transport vector. B. Range of morphological and morphodynamic dune types. C. Occurrence of morphodynamic dune types as a function of divergence angle of bi-directional flows and the proportions of sand transported in the two directions (transport ratio). (*S1*, *S2*)

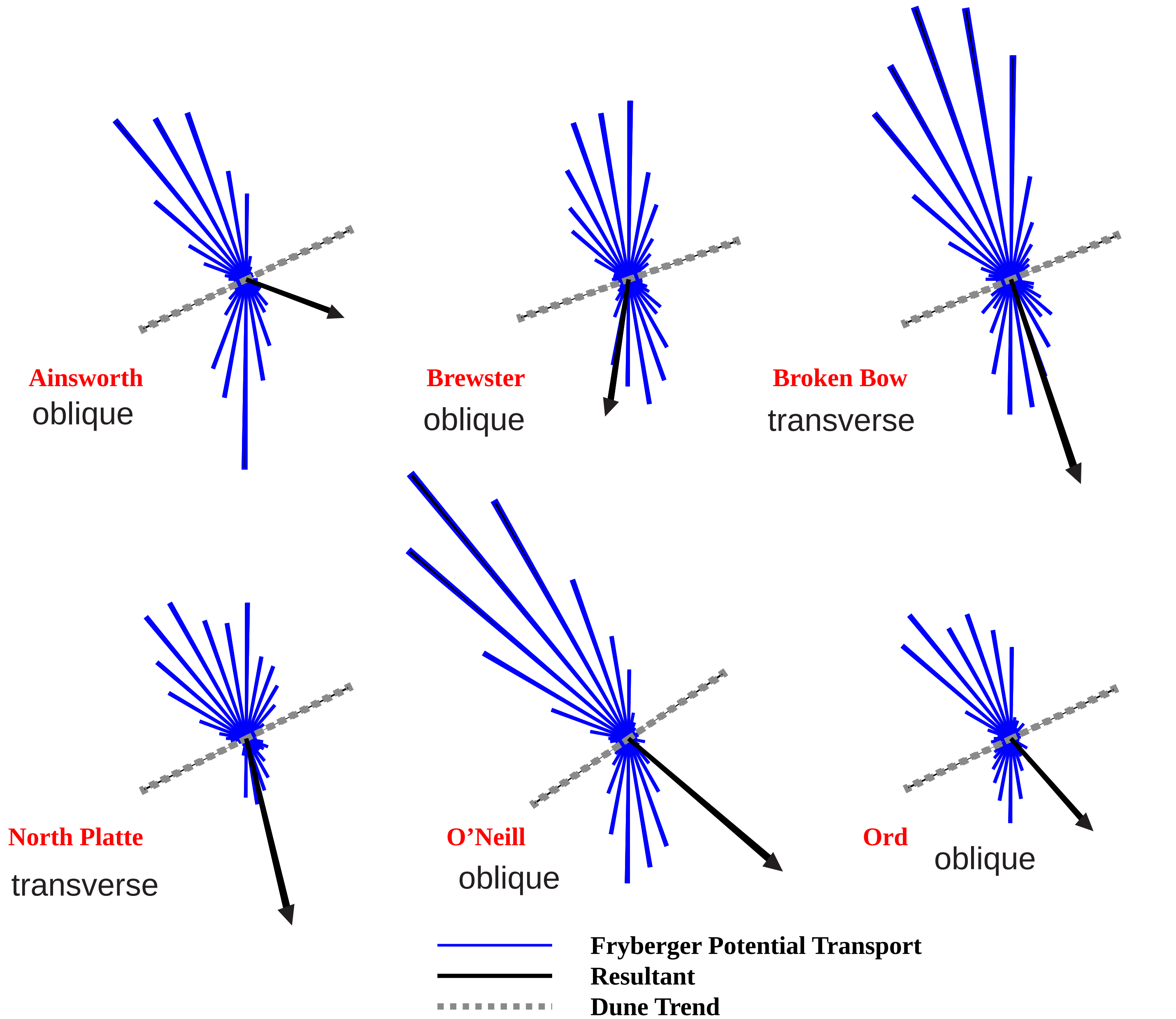


Fig. S2. Sand-drift roses for the 6 weather stations shown in Fig. 1. Roses show sand drift potential compiled with Fryberger method (*S3*) using wind data from National Climate Data Center. This method assumes the average diameter of erodible sand is 0.3 mm, and the threshold velocity for sand movement is 5.9 m/sec. Blue lines point in the direction of sand-moving winds (above 5.9 m/sec); their lengths are proportional to the rate of potential sand movement (*S4*). Dashed grey lines show hypothetical dune trends (if sand were free to move under the modern wind regime) calculated using computer program Trend (*S5*). Black arrows show sand-drift resultant vectors. Dune type at each site is based on orientation of dune trend relative to resultant transport direction (*S5*).

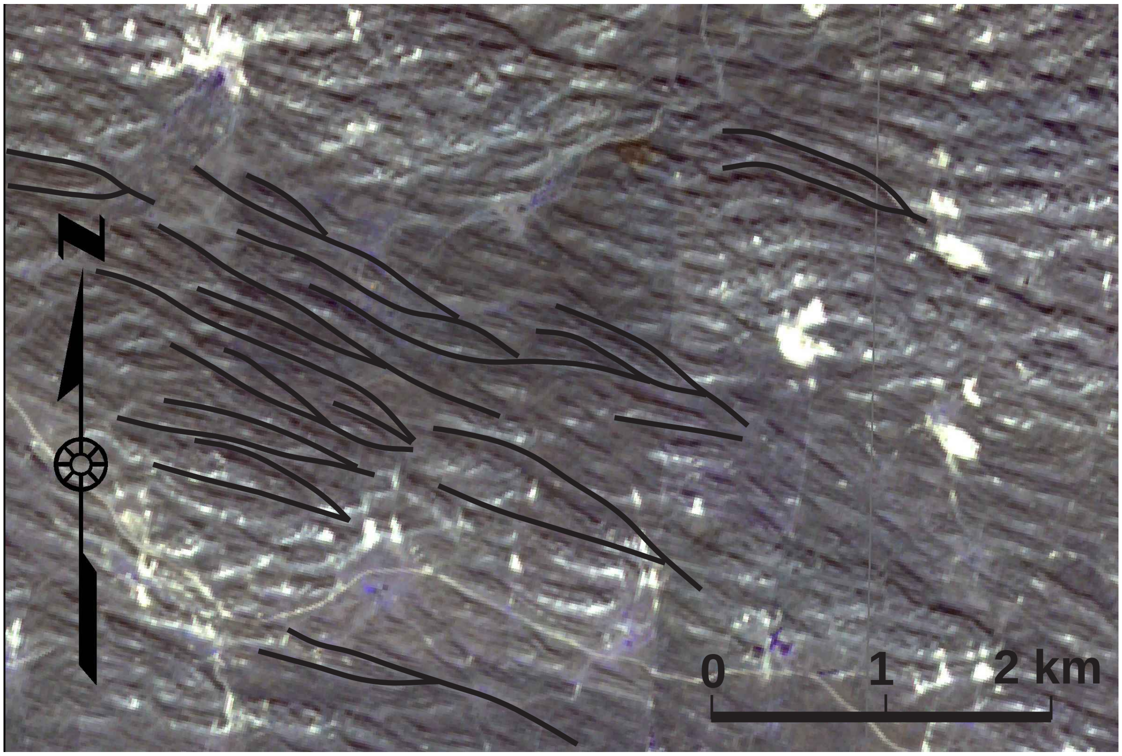
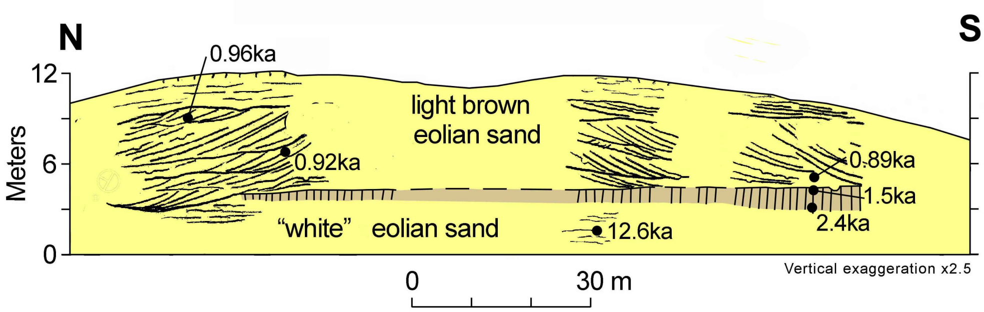


Fig. S3. ASTER image of longitudinal dunes, Nebraska Sand Hills. Lines mark dune crests and delineate y-junctions (*S6*) opening to the WNW; Thomas County, south of Dismal River.

Fig. S4a. Sedimentary structures and OSL ages from longitudinal dune; Cherry County, highway 97, milepost 81



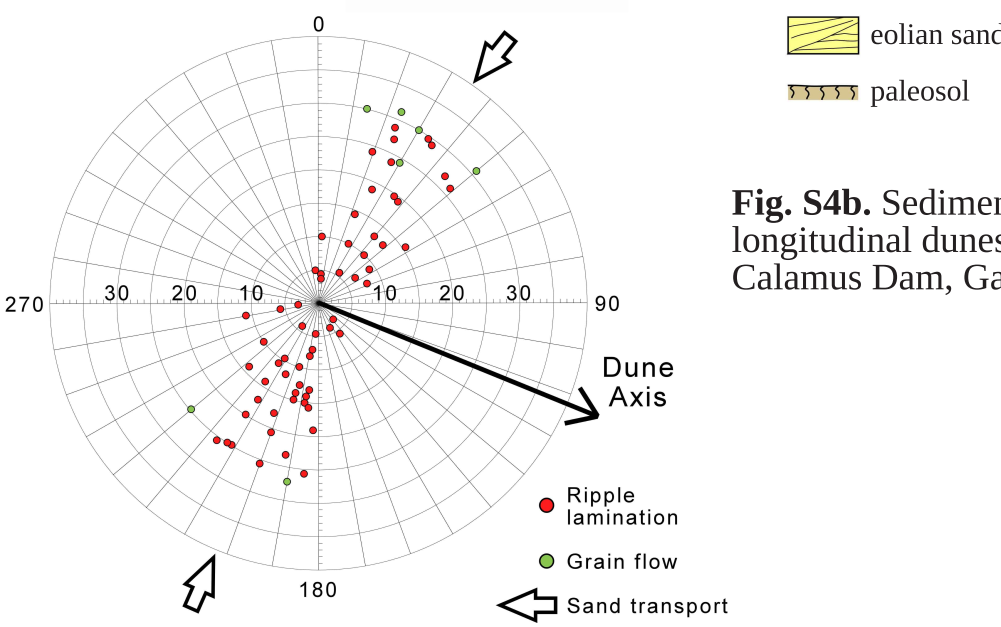


Fig. S4b. Sedimentary structures exposed in longitudinal dunes during excavation for Calamus Dam, Garfield County

Supplementary References

S1. G. Kocurek, in *Sedimentary Environments: Processes, Facies and Stratigraphy*, 3rd Ed, H.G. Reading, ed., Blackwell: 125-153 (1996).

S2. R.E. Hunter, B.M. Richmond, T.R. Alpha, *Bull. Geol. Soc. Am.* **94**, 1450 (1983).

S3. S.G. Fryberger, in *A Study of Global Sand Seas,* E.D McKee, ed.: *U.S. Geol. Surv. Prof. Paper* **1052**, 137 (1979).

S4. J.E. Bullard, *Jour. Sed. Research* **67**, 499 (1997).

S5. D.M. Rubin, H. Ikeda, *Sedimentology* **37**, 673 (1990).

S6. D.S.G. Thomas, *Z. Geomorph. N.F.* **30**, 231 (1986).