**Supplementary Table S1** Database of study location information and measured and calculated dune morphology parameters of Early Cretaceous paleo-deserts in the Ordos Basin.

| **Ancient dunes** | | | | | **Measured dune morphology parameters** | | | | | **Calculated dune morphology parameters** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Desert** | **Locality** | **No.** | **GPS** | | **DW** | **WA** | **λ** | **Փ** | **t-（N)** | **DW** | **H** |
| Central paleo-desert | Guanjiadong | 1 | 108°24'18"E | 35°11'4"N | 363 |  |  |  |  |  | 43.56 |
| 387 |  |  |  |  |  | 46.44 |
|  | 193 |  |  |  |  | 17.09 |
| Zhaojiadong | 1 | 108°23'47"E | 35°10'20"N |  | 313 |  |  |  |  | 27.72 |
|  | 194 |  |  |  |  | 17.18 |
|  | 224 |  |  | 7 (15) |  | 19.84 |
| Luohe | 1 | 108°49'39"E | 36°36'2"N | 1154 |  |  |  |  |  | 138.48 |
| 1159 |  |  |  |  |  | 139.08 |
| 2 | 108°41'34"E | 36°34'46"N | 1250 |  |  |  |  |  | 150.00 |
| 3 | 108°44'38"E | 36°34'6"N | 1968 |  |  |  |  |  | 236.16 |
| Dafosi | 1 | 107°59'32"E | 35°4'21"N | 397.6 |  |  |  |  |  | 47.71 |
| 284 |  |  |  |  |  | 34.08 |
| 145 |  |  |  |  |  | 17.40 |
| 377 |  |  |  |  |  | 45.24 |
| 1140 |  |  |  |  |  | 136.80 |
| 150.1 |  |  |  |  |  | 18.01 |
| 177 |  |  |  |  |  | 21.24 |
| 404 |  |  |  |  |  | 48.48 |
|  | 385 |  |  |  |  | 34.10 |
| Zhidan Town | 1 | 108°45'14"E | 36°50'10"E |  | 374 |  |  |  |  | 33.13 |
| Bolang Valley | 1 | 109°0'10"E | 37°30'51"N | 580 |  |  |  |  |  | 69.60 |
| 260 |  |  |  |  |  | 31.20 |
| 750 |  |  |  |  |  | 90.00 |
| 613 |  |  |  |  |  | 73.56 |
| 456 |  |  |  |  |  | 54.72 |
| 435 |  |  |  |  |  | 52.20 |
| 768 |  |  |  |  |  | 92.16 |
| 766 |  |  |  |  |  | 91.92 |
| 566 |  |  |  |  |  | 67.92 |
| 245 |  |  |  |  |  | 29.40 |
| 380 |  |  |  |  |  | 45.60 |
|  | 180 |  |  |  |  | 15.94 |
|  | 290 |  |  | 8.5 (15) |  | 25.69 |
|  | 398 |  |  |  |  | 35.25 |
|  |  | 17.8 | 3 |  | 342.52 | 41.10 |
|  |  | 23.7 | 3 |  | 456.69 | 54.80 |
|  |  | 17.8 | 3 |  | 342.52 | 41.10 |
|  |  | 11.1 | 3 |  | 212.37 | 25.48 |
|  |  | 7 | 3 |  | 133.30 | 16.00 |
|  |  | 5.4 | 3 |  | 104.66 | 12.56 |
|  |  | 6 | 3 |  | 114.49 | 13.74 |
|  |  | 7.7 | 3 |  | 148.23 | 17.79 |
|  |  | 6 | 3 |  | 114.49 | 13.74 |
|  |  | 10.5 | 3 |  | 190.81 | 22.90 |
|  |  | 7.4 | 3 |  | 143.11 | 17.17 |
|  |  | 17.1 | 3 |  | 328.29 | 39.39 |
|  |  | 13.9 | 3 |  | 267.14 | 32.06 |
|  |  | 6 | 3 |  | 114.49 | 13.74 |
|  |  | 7 | 3 |  | 133.57 | 16.03 |
|  |  | 9 | 3 |  | 171.73 | 20.61 |
|  |  | 29.8 | 3 |  | 572.43 | 68.69 |
|  |  | 7.6 | 3 |  | 145.79 | 17.50 |
|  |  | 9.3 | 3 |  | 179.36 | 21.52 |
|  |  | 12.5 | 3 |  | 241.19 | 28.94 |
|  |  | 5.74 | 3 |  | 110.29 | 13.23 |
| Xiaoshi Cliff | 1 | 108°48'21"E | 35°37'52"N | 1238.1 |  |  |  |  |  | 148.57 |
| Gan-Zhi Road | 1 | 108°43'26"E | 36°34'35"N | 1812 |  |  |  |  |  | 217.44 |
| Yongning Road | 1 | 108°41'48"E | 36°34'52"N | 2252 |  |  |  |  |  | 270.24 |
| 730 |  |  |  |  |  | 87.60 |
| 542 |  |  |  |  |  | 65.04 |
| 456 |  |  |  |  |  | 54.72 |
|  | 523 |  |  |  |  | 46.32 |
| 2 | 108°39'14"E | 36°35'4"N | 1340 |  |  |  |  |  | 160.80 |
| Huaziping | 1 | 109°7'43"E | 37°5"7"N | 950 |  |  |  |  |  | 114.00 |
| 1410 |  |  |  |  |  | 169.20 |
|  | 387 |  |  |  |  | 34.28 |
| 2 | 109°7'59"E | 37°6'18"N | 170 |  |  |  |  |  | 20.40 |
| 846 |  |  |  |  |  | 101.52 |
|  | 497 |  |  |  |  | 44.02 |
| Tiansheng Bridge | 1 | 109°1'44"E | 37°4'56"N | 650 |  |  |  |  |  | 78.00 |
| 350 |  |  |  |  |  | 42.00 |
|  | 288 |  |  |  |  | 25.51 |
|  | 370 |  |  |  |  | 32.77 |
| Ganquan Canyon | 1 | 108°58'8"E | 36°35'9"N | 550 |  |  |  |  |  | 66.00 |
|  | 270 |  |  |  |  | 23.91 |
|  | 374 |  |  |  |  | 33.13 |
| 2 | 109°0'9"E | 36°33'54"N | 505 |  |  |  |  |  | 60.60 |
| 415 |  |  |  |  |  | 49.80 |
|  | 206.12 |  |  |  |  | 18.26 |
| Maoxiang Canyon | 1 | 108°47'32"E | 36°48'1"N | 329 |  |  |  |  |  | 39.48 |
| 226 |  |  |  |  |  | 27.12 |
| 261 |  |  |  |  |  | 31.32 |
| 323 |  |  |  |  |  | 38.76 |
| 455 |  |  |  |  |  | 54.60 |
| 441 |  |  |  |  |  | 52.92 |
| 2 | 108°47'32"E | 36°48'1"N | 1223 |  |  |  |  |  | 146.76 |
| 298 |  |  |  |  |  | 35.76 |
| 1014.9 |  |  |  |  |  | 121.79 |
| 2201.3 |  |  |  |  |  | 264.16 |
| 1329.8 |  |  |  |  |  | 159.58 |
| 3 | 108°47'44"E | 36°47'28"N | 198.9 |  |  |  | 8.1 (25) |  | 23.87 |
| 1219.08 |  |  |  |  |  | 146.29 |
| 228.6 |  |  |  |  |  | 27.43 |
| 1117.1 |  |  |  |  |  | 134.05 |
|  | 135 |  |  |  |  | 11.96 |
|  | 401 |  |  |  |  | 35.52 |
|  | 492 |  |  |  |  | 43.58 |
|  | 415 |  |  |  |  | 36.76 |
| 4 | 108°48'8"E | 36°47'21"N |  | 272 |  |  |  |  | 24.09 |
| Zhu'erwan | 1 | 108°5'21"E | 35°3'9"N | 487.2 |  |  |  |  |  | 58.46 |
|  | 154 |  |  |  |  | 13.64 |
|  | 192 |  |  |  |  | 17.01 |
|  | 168.88 |  |  |  |  | 14.96 |
| Liushi Village | 1 | 108°23'3"E | 35°10'N | 277 |  |  |  |  |  | 33.24 |
| 126 |  |  |  | 6.1 (15) |  | 15.12 |
| 286 |  |  |  |  |  | 34.32 |
| 306.5 |  |  |  |  |  | 36.78 |
| 314.3 |  |  |  |  |  | 37.72 |
| Total | | | | 62 | 25 | 21 | 21 | 4 (70) | 21.00 | 108.00 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Marginal paleo-desert | Yijinhuoluoqi | 1 | 109°47'42"E | 39°27'56"N | 72.8 |  |  |  |  |  | 11.14 |
| 87.6 |  |  |  |  |  | 10.51 |
| 76.17 |  |  |  |  |  | 9.14 |
| 187 |  |  |  |  |  | 22.44 |
| 58.9 |  |  |  |  |  | 19.07 |
| 86.8 |  |  |  |  |  | 10.42 |
| 89.8 |  |  |  |  |  | 10.78 |
| 52.8 |  |  |  |  |  | 18.34 |
| 82 |  |  |  |  |  | 14.64 |
| 66.17 |  |  |  |  |  | 19.94 |
| 89.3 |  |  |  |  |  | 22.72 |
| 106.3 |  |  |  |  |  | 12.76 |
| 2 | 109°53'39"E | 39°46'40"N | 72.1 |  |  |  | 3.9（25） |  | 8.65 |
| 86 |  |  |  |  |  | 10.32 |
| 90 |  |  |  |  |  | 10.80 |
|  | 152.6 |  |  |  |  | 13.52 |
| Shenmu | 1 | 110°3'21"E | 39°9'56"N | 153.8 |  |  |  |  |  | 18.46 |
| 207.8 |  |  |  |  |  | 24.94 |
| 180 |  |  |  |  |  | 21.60 |
| 190 |  |  |  |  |  | 22.80 |
| 267.5 |  |  |  |  |  | 32.10 |
| 270 |  |  |  |  |  | 32.40 |
|  | 170.4 |  |  | 5.9（25） |  | 15.09 |
|  | 200.4 |  |  |  |  | 17.75 |
| Dongsheng West station | 1 | 109°53'51"E | 39°46'40"N | 85 |  |  |  |  |  | 10.20 |
| 104 |  |  |  |  |  | 12.48 |
| 91 |  |  |  |  |  | 10.92 |
| 94 |  |  |  |  |  | 11.28 |
| 2 | 109°34'42"E | 39°52'N | 56 |  |  |  |  |  | 6.72 |
| 94 |  |  |  |  |  | 11.28 |
| 50 |  |  |  | 3.1（25） |  | 6.00 |
| 90.8 |  |  |  |  |  | 10.90 |
| 70.8 |  |  |  |  |  | 8.50 |
| 60.7 |  |  |  |  |  | 7.28 |
| 141.7 |  |  |  |  |  | 17.00 |
| 3 | 109°36'13"E | 39°51'53"N | 79.1 |  |  |  |  |  | 9.49 |
| 65.8 |  |  |  |  |  | 7.90 |
| 51.5 |  |  |  |  |  | 6.18 |
| 61.5 |  |  |  |  |  | 7.38 |
| 55.5 |  |  |  |  |  | 6.66 |
|  | 82 |  |  |  |  | 7.26 |
| 4 | 109°38'8"E | 39°51'42"N | 77.09 |  |  |  |  |  | 9.25 |
| 84 |  |  |  |  |  | 10.08 |
| 60.1 |  |  |  |  |  | 7.21 |
| 76.7 |  |  |  |  |  | 9.20 |
| 87.2 |  |  |  |  |  | 10.46 |
| 65.8 |  |  |  |  |  | 7.90 |
| 65.06 |  |  |  |  |  | 7.81 |
| 77.67 |  |  |  |  |  | 9.32 |
| 65.73 |  |  |  |  |  | 7.89 |
| 99.35 |  |  |  |  |  | 11.92 |
| 60.8 |  |  |  |  |  | 7.30 |
| 72.23 |  |  |  |  |  | 8.67 |
| 63.1 |  |  |  |  |  | 7.57 |
| 76.4 |  |  |  |  |  | 9.17 |
| 77.2 |  |  |  |  |  | 9.26 |
| 97.78 |  |  |  |  |  | 11.73 |
|  | 85.6 |  |  |  |  | 7.58 |
|  | 89.3 |  |  |  |  | 7.91 |
|  | 99.6 |  |  |  |  | 8.82 |
| 5 | 109°40'25"E | 39°51'8"N | 86.31 |  |  |  |  |  | 10.36 |
| 82.6 |  |  |  |  |  | 9.91 |
| 129.4 |  |  |  |  |  | 15.53 |
| 133.8 |  |  |  |  |  | 16.06 |
| 6 | 109°45'21"E | 39°50'48”N | 87.13 |  |  |  |  |  | 10.46 |
| 145 |  |  |  |  |  | 17.40 |
|  | 87.3 |  |  |  |  | 7.73 |
|  | 52.6 |  |  |  |  | 4.66 |
|  | 58.4 |  |  |  |  | 5.17 |
|  | 73.4 |  |  |  |  | 6.50 |
|  | 82.4 |  |  |  |  | 7.30 |
| 7 | 110°1'59"E | 39°43'3"N | 168 |  |  |  |  |  | 20.16 |
| 84.8 |  |  |  |  |  | 10.18 |
| 54.2 |  |  |  |  |  | 6.50 |
| 99.37 |  |  |  |  |  | 11.92 |
| 94.7 |  |  |  |  |  | 11.36 |
| 84.17 |  |  |  |  |  | 10.10 |
| 96.8 |  |  |  |  |  | 11.62 |
| 150.15 |  |  |  |  |  | 18.02 |
| 97 |  |  |  |  |  | 11.64 |
|  |  | 192 | 3 |  | 36.63 | 4.39 |
|  | 166 |  |  |  |  | 14.70 |
|  | 93 |  |  |  |  | 8.24 |
|  | 130 |  |  |  |  | 11.51 |
| 8 | 110°6'50"E | 39°45'41"N | 80.08 |  |  |  |  |  | 9.61 |
| 54.5 |  |  |  |  |  | 6.54 |
| 159.5 |  |  |  |  |  | 19.14 |
| 143 |  |  |  |  |  | 17.16 |
| 76.7 |  |  |  |  |  | 9.20 |
| 93.02 |  |  |  |  |  | 11.16 |
| 106.6 |  |  |  |  |  | 12.79 |
| 107 |  |  |  |  |  | 12.84 |
|  | 60.6 |  |  |  |  | 5.37 |
|  | 106 |  |  |  |  | 9.39 |
|  | 71 |  |  |  |  | 6.29 |
|  | 74 |  |  |  |  | 6.55 |
|  | 81.2 |  |  |  |  | 7.19 |
|  | 51.6 |  |  |  |  | 4.57 |
|  | 150 |  |  |  |  | 13.29 |
|  | 64 |  |  |  |  | 5.67 |
|  | 72.1 |  |  |  |  | 6.39 |
| 9 | 109°51'6"E | 39°44'56"N | 114 |  |  |  |  |  | 13.68 |
|  | 62.3 |  |  |  |  | 5.52 |
|  | 85.6 |  |  |  |  | 7.58 |
|  | 72.3 |  |  |  |  | 6.40 |
|  | 88.4 |  |  |  |  | 7.83 |
|  | 106 |  |  |  |  | 9.39 |
|  | 90.6 |  |  |  |  | 8.02 |
|  | 87.9 |  |  |  |  | 7.79 |
|  | 65.4 |  |  |  |  | 5.79 |
|  | 70.9 |  |  |  |  | 6.28 |
|  | 135.6 |  |  |  |  | 12.01 |
|  | 61.3 |  |  |  |  | 5.43 |
| 10 | 109°52'1"E | 39°43'25"N |  |  | 447 | 5.6 | 3（25） | 45.58 | 5.47 |
| 11 | 109°51'32"E | 39°44'24"N |  | 88 |  |  |  |  | 7.79 |
|  | 119 |  |  |  |  | 10.54 |
|  | 130 |  |  |  |  | 11.51 |
| 12 | 109°51'15"E | 39°45'N |  | 70 |  |  |  |  | 6.20 |
|  | 86 |  |  |  |  | 7.62 |
|  | 77 |  |  |  |  | 6.82 |
|  | 93.31 |  |  |  |  | 8.26 |
|  | 87 |  |  |  |  | 7.71 |
|  | 111 |  |  |  |  | 9.83 |
| Dongsheng Airport | 1 | 109°54'22"E | 39°33'9"N | 168.5 |  |  |  |  |  | 20.22 |
| 86 |  |  |  |  |  | 10.32 |
| 66 |  |  |  |  |  | 9.12 |
| 144 |  |  |  |  |  | 17.28 |
| 157 |  |  |  |  |  | 18.84 |
|  | 98 |  |  |  |  | 8.68 |
|  | 200.54 |  |  |  |  | 17.76 |
|  | 160.7 |  |  |  |  | 14.23 |
|  | 140.8 |  |  |  |  | 12.47 |
| 2 | 109°53'20"E | 39°46'22"N |  | 162.6 |  |  |  |  | 14.40 |
| Total | | | | 82 | 49 | 2 | 2 | 4（100） | 2.00 | 133.00 |
| Total | | | | | 144 | 74 | 23 | 23 | 170 | 23.00 | 241.00 |