Supplementary material

Table S1. Sites of Holocene precipitation reconstruction in the Mu Us Desert and adjacent area.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Site | Latitude/° | Longitude/° | Modern precipitation/mm | Holoceneprecipitation/mm | Age | Methodology | Reference |
| 1 | HJN | 39.09 | 109.89 | 380 | 500 | - | Lake hydrologic modeling  | This study |
| 2 | DLTR | 39.48 | 108.4 | 288 | 443 | 9.32-6.43ka B.P. |
| 3 | BZN | 38.75 | 108.82 | 322 | 471 | 7.83-5.97ka B.P.＊ |
| 4 | SRBDY | 39.25 | 108.29 | 279 | 444 | - |
| 5 | BJHZ | 39.79 | 109.33 | 317 | 472 | - |
| 6 | HJL | 39.11 | 110.09 | 385 | 510±25 | 7.5-5ka B.P. | Pollen | (Chen et al., 1993) |
| 7 | TB | 38.71 | 108.9 | 345 | 470±25 | Pollen |
| 8 | ABL | 39.79 | 110.4 | 375 | 497.58 | ~8-6ka B.P. | Pollen | (Shi et al., 1988) |
| 9 | LJY | 39.57 | 111.32 | 412 | 473.18 | Pollen |
| 10 | MLH | 40.01 | 108.09 | 230 | 342.91 | Pollen |
| 11 | WLX | 39.06 | 107.72 | 245 | 355.47 | Pollen |
| 12 | WS | 38.72 | 109 | 348 | 461.8 | Pollen |
| 13 | SLG | 39.81 | 109.68 | 348 | 478.06 | Pollen |
| 14 | HJP | 39.77 | 109.95 | 360 | 493.7 | Pollen |
| 15 | XM | 39.39 | 110.31 | 381 | 493.92 | Pollen |
| 16 | TL | 38.26 | 108.88 | 369 | 485.4 | Pollen |
| 17 | WLB | 39.22 | 107.95 | 257 | 365 | ~8.5-5ka B.P. | Pollen | (Shi, 1991) |
| 18 | CBWS | 38.72 | 107.27 | 267 | 361 | Pollen |
| 19 | DSG | 37.67 | 108.37 | 382 | 555.2 | Pollen |
| 20 | LX | 37.55 | 108.83 | 411 | 571.9 | Pollen |
| 21 | BTW | 37.95 | 108.84 | 383 | 480.1 | Pollen |
| 22 | LSW | 37.72 | 108.93 | 404 | 525±25 | 9-4ka | Pollen | (Huang, 1991) |
| 23 | GH | 38.91 | 112.23 | 445 | 556.5±17.5 | 11.5-3.3ka B.P. | Pollen | (Chen et al., 2015) |
| 24 | LC | 35.71 | 109.41 | 590 | 671 | 10.7-6.7ka B.P. | 10Be | (Zhang et al., 2020) |
| 25 | DH | 40.57 | 112.68 | 400 | 487.9 | 7.88-2.93ka B.P. | Pollen | (Xu et al., 2010a) |
| 26 | TC | 35.26 | 106.31 | 491 | 597.8 | Mid Holocene | Pollen | (Chen et al., 2018) |
| 27 | JLT | 39.71 | 105.7 | 140 | 246 | 8.5-3.5ka B.P. | Pollen | (Wu et al., 2018) |
| 28 | BJL | 39.06 | 104.13 | 143.5 | 251 | Mid-Holocene | Water balance model | (Liu and Li, 2017) |
| 29 | BJD | 39.93 | 102.29 | 100 | >200 | Early to Mid-Holocene | - | (Yang and Williams, 2003) |
| 30 | DJHZ | 41.12 | 112.59 | 350 | 525±25 | 9.4-6.3ka B.P. | Pollen | (Shi and Song, 2003) |
| 31 | BYCG | 41.63 | 115.2 | 380 | 502.2 | 11-5.5ka B.P. | Pollen | (Jiang et al., 2006) |
| 32 | SV1 | 43.03 | 116.33 | 380 | 480 | Mid-Holocene | Surviving vegetation community | (Cui and Chen, 1993) |
| 33 | SV2 | 42.76 | 116.82 | 390 | 490 |
| 34 | SV3 | 43.52 | 118.79 | 400 | 500 |
| 35 | SV4 | 43.02 | 119.17 | 390 | 490 |
| 36 | SV5 | 42.89 | 119.6 | 410 | 510 |
| 37 | SV6 | 43.76 | 117.57 | 420 | 520 |
| 38 | CGL | 43.41 | 114.93 | 250 | 380 | 9.2-7ka B.P. | Pollen | (Li et al., 2020) |
| 39 | BYD | 38.85 | 116.03 | 547 | 747 | 7.6-3.7ka B.P. | Pollen | (Xu et al., 1988) |
| 40 | CDP | 36.1 | 114.4 | 550 | 657.5 | 9.26-4.36ka B.P. | Pollen | (Xu et al., 2010b) |
| 41 | MS | 34.94 | 113.37 | 645 | 825.7 | 11.2-4.9ka B.P. | GDGT | (Li and Gao, 2019) |
| 42 | LT | 34.2 | 109.2 | 650 | 815 | 8.3-4.4ka B.P. | GDGT | (Zhao et al., 2018) |
| 43 | MJY | 36.03 | 108.17 | 525 | 690±30 | 8.5-3.1ka B.P. | Magnetic susceptibility | (HUANG et al., 2004) |
| 44 | SLJ | 35.86 | 102.81 | 430 | 554 | ~7-4ka B.P. | GDGT | (Zhao et al., 2018) |
| 45 | QHL | 36.88 | 100.24 | 380 | 595±15 | 7.5-5ka B.P. | Water balance model | (Jia et al., 2000) |

＊The age data are quoted from Liu. (2018).

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