

**Table S1:** raw radiocarbon dates

| <b>Core</b> | <b>Core code</b> | <b>Depth interval</b> |       | <b>Mid-depth</b> | <b>Sample thickness, cm</b> | <b>Corrected depth, cm</b> | <b>Pollen purity (%)</b> | <b>Age <sup>14</sup>C BP</b> | <b>error</b> |
|-------------|------------------|-----------------------|-------|------------------|-----------------------------|----------------------------|--------------------------|------------------------------|--------------|
| Box         | LBB-AMS-1        | 0                     | 4     | 2                | 4                           | 14.5                       | 90                       | 1950                         | 35           |
| Box         | LBB-AMS-2        | 20                    | 24    | 22               | 4                           | 34.5                       | 95                       | 2375                         | 25           |
| Box         | LBB-AMS-3        | 32                    | 35    | 33.5             | 3                           | 46                         | 95                       | 2945                         | 30           |
| Box         | LBB-AMS-4        | 56                    | 59    | 57.5             | 3                           | 70                         | 95                       | 4530                         | 40           |
| Box         | LBB-AMS-5        | 77                    | 80    | 78.5             | 3                           | 91                         | 95                       | 5455                         | 35           |
| Box         | LBB-AMS-6        | 89                    | 92    | 90.5             | 3                           | 103                        | 90                       | 6170                         | 40           |
| Box         | LBB-AMS-7        | 101                   | 104   | 102.5            | 3                           | 115                        | 85                       | 6700                         | 40           |
| Box         | LBB-AMS-8        | 121                   | 124   | 122.5            | 3                           | 135                        | 85                       | 7760                         | 40           |
| Box         | LBB-AMS-9        | 138                   | 141   | 139.5            | 3                           | 152                        | 90                       | 8620                         | 40           |
| Piston      | LBF-AMS-11a      | 12                    | 18    | 15               | 6                           | 154                        | n.d.                     | 8810                         | 50           |
| Box         | LBB-AMS-10       | 145                   | 148   | 146.5            | 3                           | 159                        | 90                       | 8750                         | 50           |
| Box         | LBB-AMS-11       | 159                   | 163   | 161              | 4                           | 173.5                      | 90                       | 9470                         | 50           |
| Box         | LBB-AMS-12       | 171.5                 | 175.5 | 173.5            | 4                           | 186                        | 80                       | 10030                        | 50           |
| Piston      | LBF-AMS-12a      | 48                    | 56    | 52               | 8                           | 191                        | n.d.                     | 10340                        | 60           |
| Piston      | LBF-AMS-13       | 65                    | 73    | 69               | 8                           | 208                        | n.d.                     | 10730                        | 60           |
| Piston      | LBF-AMS-14       | 90                    | 98    | 94               | 8                           | 233                        | n.d.                     | 11820                        | 70           |
| Piston      | LBF-AMS-15       | 116                   | 124   | 120              | 8                           | 259                        | n.d.                     | 13340                        | 130          |

**Table S2:** Diatom species biovolume coefficients, based on median of measured linear dimensions of Holocene valves (Hillebrand et al. 1999).

| Species                              | Biovolume coefficient ( $\mu\text{m}/\text{m}^3$ ) |
|--------------------------------------|--|
| <i>Cyclotella baicalensis</i>        | 58023  |
| <i>Stephanodiscus flabellatus</i>    | 25135  |
| <i>Aulacoseira baicalensis</i>       | 7540   |
| <i>Synedra acus v. radians</i>       | 1280   |
| <i>Aulacoseira skvortzowii</i>       | 865  |
| <i>Cyclotella minuta</i>             | 860  |
| <i>Synedra acus v. pusilla</i>       | 500  |
| <i>Stephanodiscus skabitchevskii</i> | 455  |
| <i>Stephanodiscus meyerii</i>        | 443  |
| <i>Cyclostephanos dubius</i>         | 393  |
| <i>Asterionella formosa</i>          | 325  |
| <i>Crateriportula inconspicua</i>    | 202  |
| <i>Stephanodiscus formosus</i>       | 185  |
| <i>Stephanodiscus parvus</i>         | 118  |