**Supplementary Table 3** Glass shard major and minor oxide composition of tephra layers in the lake and peat sediment cores recovered during this study. Refer also to Figure 8.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tephra nb# | Ri-10 |  | Ri-20 |  | Ri-22 |  | Ri-24 |  | Ri-26 |  | Ri-30 |  | Ri-34 |  | Ri-40 |  | Ri-47 |  |
| (wt%) | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* |  |
| SiO2 | 62.83 | *0.75* | 65.46 | *1.64* | 67.10 | *1.26* | 57.73 | *2.29* | 59.05 | *1.16* | 55.51 | *2.61* | 72.58 | *0.88* | 70.98 | *0.95* | 69.50 | *0.51* |
| Al2O3 | 16.61 | *0.51* | 16.36 | *0.65* | 16.29 | *1.16* | 16.17 | *0.51* | 15.68 | *0.89* | 13.63 | *1.63* | 14.19 | *0.50* | 14.53 | *0.49* | 15.47 | *0.19* |
| TiO2 | 0.92 | *0.10* | 0.62 | *0.12* | 0.56 | *0.13* | 1.22 | *0.24* | 1.00 | *0.14* | 1.10 | *0.18* | 0.45 | *0.07* | 0.48 | *0.12* | 0.50 | *0.11* |
| FeOtotal | 4.31 | *0.42* | 3.54 | *0.81* | 2.89 | *0.62* | 7.05 | *1.47* | 6.44 | *0.81* | 7.12 | *1.11* | 1.36 | *0.21* | 2.33 | *0.29* | 2.15 | *0.27* |
| MnO | 0.15 | *0.13* | 0.18 | *0.09* | 0.14 | *0.07* | 0.30 | *0.14* | 0.30 | *0.09* | 0.37 | *0.10* | 0.09 | *0.15* | 0.12 | *0.12* | 0.13 | *0.10* |
| MgO | 1.64 | *0.49* | 1.33 | *1.21* | 0.80 | *0.47* | 2.53 | *1.11* | 2.95 | *0.81* | 5.77 | *1.81* | 0.21 | *0.15* | 0.36 | *0.14* | 0.50 | *0.10* |
| CaO | 3.03 | *0.42* | 2.70 | *0.57* | 2.22 | *0.51* | 4.89 | *0.55* | 5.27 | *0.66* | 9.63 | *3.49* | 0.92 | *0.38* | 1.44 | *0.42* | 2.07 | *0.20* |
| Na2O | 4.84 | *0.17* | 4.73 | *0.33* | 4.67 | *0.36* | 4.62 | *0.27* | 4.59 | *0.31* | 3.43 | *0.71* | 4.39 | *0.36* | 4.39 | *0.32* | 4.81 | *0.14* |
| K2O | 5.15 | *0.31* | 4.65 | *0.48* | 4.89 | *0.52* | 4.42 | *0.48* | 3.86 | *0.50* | 2.79 | *0.90* | 5.56 | *0.41* | 4.97 | *0.44* | 4.55 | *0.10* |
| Cl | 0.34 | *0.06* | 0.30 | *0.09* | 0.24 | *0.16* | 0.38 | *0.16* | 0.33 | *0.07* | 0.25 | *0.11* | 0.29 | *0.12* | 0.29 | *0.07* | 0.36 | *0.05* |
| Total | 97.83 |  | 98.94 |  | 98.21 |  | 99.36 |  | 99.13 |  | 99.55 |  | 98.34 |  | 98.62 |  | 96.29 |  |
| *n* | *9* |  | *19* |  | *9* |  | *8* |  | *9* |  | *9* |  | *8* |  | *11* |  | *10* |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Stent |  | Ri-51 |  | Ri-58 |  | Ri-60 |  | Ri-70 |  | Ri-84 |  | Ri-95 |  | Ri-109 |  | Ri-121 |  | Ri-123 | |  |
| avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | | |  |
| 75.89 | *0.28* | 67.84 | *0.59* | 67.39 | *0.36* | 67.07 | *0.29* | 69.33 | *0.38* | 67.80 | *0.82* | 68.30 | *0.32* | 64.56 | *0.40* | 65.68 | *1.99* | 64.53 | *1.41* | |
| 13.04 | *0.11* | 16.01 | *0.22* | 16.15 | *0.13* | 16.23 | *0.13* | 15.54 | *0.18* | 15.65 | *0.30* | 15.52 | *0.13* | 16.31 | *0.37* | 16.46 | *0.82* | 15.78 | *0.84* | |
| 0.22 | *0.05* | 0.55 | *0.04* | 0.57 | *0.05* | 0.60 | *0.08* | 0.55 | *0.09* | 0.75 | *0.07* | 0.59 | *0.06* | 0.83 | *0.08* | 0.75 | *0.18* | 0.92 | *0.13* | |
| 1.77 | *0.09* | 2.70 | *0.23* | 2.69 | *0.08* | 2.77 | *0.41* | 2.21 | *0.22* | 2.70 | *0.39* | 2.99 | *0.30* | 4.16 | *0.15* | 3.41 | *1.05* | 4.60 | *0.80* | |
| 0.07 | *0.06* | 0.20 | *0.08* | 0.20 | *0.09* | 0.19 | *0.10* | 0.13 | *0.04* | 0.15 | *0.06* | 0.14 | *0.10* | 0.22 | *0.07* | 0.15 | *0.12* | 0.17 | *0.11* | |
| 0.18 | *0.05* | 0.77 | *0.04* | 0.73 | *0.05* | 0.72 | *0.07* | 0.52 | *0.09* | 0.73 | *0.13* | 0.61 | *0.05* | 1.31 | *0.07* | 0.75 | *0.43* | 1.04 | *0.25* | |
| 1.31 | *0.06* | 2.54 | *0.14* | 2.41 | *0.10* | 2.30 | *0.08* | 1.95 | *0.08* | 2.03 | *0.30* | 1.89 | *0.10* | 2.85 | *0.25* | 2.26 | *0.66* | 2.03 | *0.72* | |
| 4.30 | *0.06* | 4.78 | *0.14* | 4.98 | *0.17* | 5.00 | *0.08* | 4.49 | *0.09* | 4.65 | *0.15* | 4.74 | *0.11* | 4.97 | *0.14* | 4.86 | *0.55* | 4.87 | *0.49* | |
| 2.97 | *0.03* | 4.34 | *0.07* | 4.49 | *0.07* | 4.64 | *0.07* | 4.98 | *0.08* | 5.11 | *0.13* | 4.66 | *0.13* | 4.33 | *0.21* | 5.14 | *0.59* | 5.33 | *0.57* | |
| 0.23 | *0.03* | 0.41 | *0.04* | 0.41 | *0.04* | 0.40 | *0.04* | 0.36 | *0.05* | 0.32 | *0.06* | 0.40 | *0.06* | 0.33 | *0.06* | 0.19 | *0.24* | 0.37 | *0.04* | |
| 102.30 |  | 97.65 |  | 98.40 |  | 98.39 |  | 98.50 |  | 99.11 |  | 99.18 |  | 98.99 |  | 99.00 |  | 99.17 |  | |
| *10* |  | *5* |  | *6* |  | *8* |  | *10* |  | *10* |  | *9* |  | *5* |  | *10* |  | 10 |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ri-132 | |  | T-2 |  | T-4 |  | T-8 |  | T-9 |  | T-10 |  | T-14 |  | T-15 |  | T-16 |  | T-17 | |  |
| avg. | *±S.D.* | | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | | |  |
| 71.58 | *0.61* | | 63.95 | *0.57* | 55.06 | *2.93* | 65.34 | *1.13* | 58.04 | *2.26* | 56.88 | *0.94* | 71.19 | *0.97* | 70.86 | *1.12* | 68.21 | *0.53* | 68.01 | *0.45* | |
| 14.67 | *0.68* | | 16.62 | *0.79* | 16.77 | *1.30* | 16.87 | *0.54* | 16.74 | *1.11* | 16.32 | *0.97* | 15.57 | *0.91* | 15.14 | *0.97* | 15.43 | *0.40* | 15.62 | *0.29* | |
| 0.51 | *0.06* | | 0.77 | *0.07* | 1.01 | *0.30* | 0.56 | *0.11* | 1.05 | *0.26* | 1.10 | *0.10* | 0.40 | *0.05* | 0.48 | *0.10* | 0.63 | *0.09* | 0.60 | *0.12* | |
| 2.04 | *0.20* | | 3.93 | *0.63* | 6.51 | *2.10* | 3.19 | *0.62* | 7.13 | *2.91* | 7.39 | *0.74* | 1.47 | *0.32* | 1.77 | *0.82* | 3.24 | *0.77* | 3.14 | *0.39* | |
| 0.10 | *0.12* | | 0.22 | *0.08* | 0.32 | *0.11* | 0.17 | *0.11* | 0.32 | *0.12* | 0.31 | *0.08* | 0.11 | *0.10* | 0.13 | *0.16* | 0.07 | *0.08* | 0.19 | *0.09* | |
| 0.43 | *0.11* | | 1.46 | *0.76* | 3.76 | *1.39* | 1.06 | *0.32* | 2.12 | *0.45* | 3.18 | *0.90* | 0.28 | *0.18* | 0.47 | *0.42* | 0.45 | *0.09* | 0.43 | *0.08* | |
| 1.95 | *0.35* | | 3.21 | *0.26* | 9.16 | *2.64* | 3.03 | *0.47* | 5.06 | *0.41* | 5.89 | *0.86* | 1.59 | *0.53* | 1.64 | *0.53* | 1.61 | *0.24* | 1.77 | *0.14* | |
| 4.68 | *0.21* | | 4.71 | *0.26* | 3.93 | *0.75* | 4.70 | *0.14* | 4.87 | *0.30* | 4.43 | *0.24* | 4.79 | *0.43* | 4.56 | *0.40* | 5.59 | *0.19* | 5.46 | *0.15* | |
| 3.75 | *0.20* | | 4.43 | *0.17* | 2.52 | *0.68* | 4.47 | *0.33* | 3.63 | *0.34* | 3.40 | *0.40* | 4.69 | *0.56* | 4.94 | *0.39* | 4.22 | *0.08* | 4.19 | *0.13* | |
| 0.35 | *0.07* | | 0.35 | *0.14* | 0.25 | *0.06* | 0.36 | *0.05* | 0.38 | *0.10* | 0.34 | *0.09* | 0.19 | *0.13* | 0.22 | *0.10* | 0.32 | *0.05* | 0.32 | *0.04* | |
| 95.52 |  | | 96.58 |  | 98.06 |  | 95.17 |  | 97.49 |  | 98.80 |  | 97.87 |  | 98.18 |  | 100.25 |  | 100.50 |  | |
| *5* |  | | *9* |  | *7* |  | *8* |  | *10* |  | *9* |  | *15* |  | *9* |  | *5* |  | *5* |  | |

**Table 4** *(continued)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| T-21 |  | T-23 |  | T-24 |  | T-26 |  | T-27 |  | T-28 |  | T-38 |  | T-45 |  | T-51 |  | T-54 | |  |
| avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | | |  |
| 65.01 | *0.19* | 64.12 | *2.08* | 64.39 | *1.42* | 65.67 | *2.05* | 69.70 | *0.52* | 69.48 | *1.96* | 58.67 | *0.21* | 60.75 | *0.88* | 58.90 | *0.37* | 59.84 | *0.61* | |
| 16.92 | *0.10* | 16.47 | *0.63* | 16.45 | *0.37* | 15.81 | *0.94* | 15.22 | *0.23* | 14.76 | *1.23* | 15.87 | *0.51* | 16.67 | *0.26* | 16.60 | *0.79* | 16.22 | *0.44* | |
| 0.83 | *0.07* | 0.84 | *0.15* | 0.83 | *0.16* | 0.82 | *0.26* | *0.59* | *0.05* | *0.55* | *0.10* | 1.13 | *0.14* | 1.10 | *0.10* | 1.26 | *0.10* | 1.29 | *0.07* | |
| 3.53 | *0.20* | 4.02 | *0.76* | 3.85 | *0.83* | 3.72 | *1.01* | *2.11* | *0.15* | *2.53* | *1.13* | 7.63 | *0.43* | 5.55 | *0.32* | 6.31 | *0.71* | 6.31 | *0.40* | |
| 0.16 | *0.13* | 0.17 | *0.10* | 0.17 | *0.08* | 0.15 | *0.08* | 0.11 | *0.12* | 0.14 | *0.14* | 0.24 | *0.08* | 0.23 | *0.08* | 0.18 | *0.08* | 0.23 | *0.12* | |
| 0.98 | *0.06* | 1.21 | *0.75* | 1.10 | *0.23* | 0.86 | *0.36* | *0.56* | *0.05* | *0.64* | *0.78* | 2.25 | *0.22* | 1.79 | *0.25* | 1.94 | *0.29* | 1.82 | *0.19* | |
| 2.49 | *0.13* | 2.73 | *0.88* | 2.41 | *0.49* | 2.11 | *0.58* | 1.31 | *0.08* | 1.41 | *0.60* | 5.28 | *0.26* | 4.16 | *0.47* | 4.85 | *0.35* | 4.47 | *0.36* | |
| 5.02 | *0.27* | 4.85 | *0.29* | 4.82 | *0.15* | 4.94 | *0.26* | *4.64* | *0.12* | *4.50* | *0.42* | 4.23 | *0.13* | 4.45 | *0.20* | 4.60 | *0.18* | 4.63 | *0.16* | |
| 4.49 | *0.14* | 4.84 | *0.55* | 5.31 | *0.39* | 5.20 | *0.59* | *5.70* | *0.12* | *5.45* | *0.68* | 3.73 | *0.15* | 4.45 | *0.31* | 4.45 | *0.29* | 4.27 | *0.25* | |
| 0.42 | *0.03* | 0.36 | *0.06* | 0.34 | *0.05* | 0.31 | *0.09* | *0.35* | *0.04* | *0.28* | *0.10* | 0.34 | *0.08* | 0.33 | *0.06* | 0.28 | *0.05* | 0.34 | *0.06* | |
| 101.33 |  | 97.87 |  | 96.76 |  | 97.32 |  | 95.70 |  | 95.41 |  | 97.49 |  | 101.28 |  | 98.04 |  | 97.85 |  | |
| *10* |  | *11* |  | *9* |  | *14* |  | *7* |  | *10* |  | *5* |  | *8* |  | *8* |  | *7* |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| T-59 |  | T-60 |  | T-64 |  | N-6 |  | N-8 |  | N-9 |  | N-19 |  | N-21 |  | N-22 |  | N-23 | |  |
| avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | | |  |
| 60.08 | *1.52* | 60.03 | *0.92* | 61.72 | *0.54* | 57.52 | *2.40* | 71.69 | *1.23* | 71.61 | *0.83* | 69.27 | *0.47* | 69.25 | *2.20* | 68.13 | *0.28* | 69.67 | *2.57* | |
| 15.62 | *1.23* | 16.36 | *0.47* | 17.05 | *0.21* | 15.76 | *1.31* | 15.12 | *0.98* | 14.94 | *0.63* | 15.32 | *0.12* | 15.35 | *0.84* | 15.83 | *0.18* | 15.65 | *1.10* | |
| 0.94 | *0.15* | 1.16 | *0.17* | 0.92 | *0.09* | 0.95 | *0.11* | 0.42 | *0.08* | 0.45 | *0.07* | 0.57 | *0.08* | 0.57 | *0.16* | 0.58 | *0.08* | 0.59 | *0.23* | |
| 5.60 | *1.95* | 6.04 | *0.49* | 5.03 | *0.23* | 6.62 | *0.89* | 1.38 | *0.30* | 1.56 | *0.27* | 2.07 | *0.18* | 2.06 | *0.53* | 2.27 | *0.09* | 1.80 | *0.75* | |
| 0.24 | *0.14* | 0.21 | *0.07* | 0.21 | *0.08* | 0.31 | *0.09* | 0.14 | *0.06* | 0.19 | *0.08* | 0.21 | *0.09* | 0.11 | *0.11* | 0.13 | *0.04* | 0.10 | *0.13* | |
| 2.07 | *1.33* | 1.58 | *0.38* | 1.38 | *0.20* | 4.00 | *1.62* | 0.26 | *0.11* | 0.29 | *0.16* | 0.50 | *0.06* | 0.53 | *0.24* | 0.65 | *0.07* | 0.57 | *0.61* | |
| 4.09 | *1.62* | 4.35 | *0.57* | 3.18 | *0.31* | 6.19 | *2.69* | 1.44 | *0.46* | 1.36 | *0.32* | 1.74 | *0.17* | 1.74 | *0.47* | 2.10 | *0.14* | 1.59 | *0.92* | |
| 4.83 | *0.34* | 4.74 | *0.18* | 5.15 | *0.19* | 4.20 | *0.67* | 4.45 | *0.49* | 4.39 | *0.35* | 4.72 | *0.07* | 4.61 | *0.33* | 4.78 | *0.10* | 4.42 | *0.72* | |
| 4.73 | *0.54* | 4.33 | *0.31* | 4.47 | *0.23* | 3.50 | *0.65* | 4.86 | *0.55* | 4.96 | *0.42* | 4.93 | *0.08* | 5.11 | *0.28* | 4.93 | *0.19* | 5.35 | *0.64* | |
| 0.51 | *0.12* | 0.41 | *0.05* | 0.50 | *0.05* | 0.27 | *0.15* | 0.33 | *0.13* | 0.30 | *0.11* | 0.38 | *0.06* | 0.40 | *0.04* | 0.40 | *0.06* | 0.15 | *0.11* | |
| 97.49 |  | 98.35 |  | 101.98 |  | 99.51 |  | 95.77 |  | 97.72 |  | 95.04 |  | 96.98 |  | 96.08 |  | 96.98 |  | |
| *8* |  | *9* |  | *10* |  | *9* |  | *7* |  | *10* |  | *10* |  | *8* |  | *7* |  | *8* |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N-25 |  | N-26 |  | N-30 |  | N-32 |  | N-45 |  | N-50 |  | N-54 |  | N-57 |  | N-58 |  | N-60 | |  |
| avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | | |  |
| 69.57 | *2.31* | 71.62 | *1.35* | 68.82 | *2.07* | 67.97 | *1.15* | 67.18 | *0.42* | 64.60 | *0.30* | 66.62 | *0.55* | 64.40 | *0.73* | 61.64 | *1.19* | 62.02 | *1.34* | |
| 15.58 | *0.80* | 15.45 | *1.10* | 15.41 | *1.39* | 15.55 | *0.47* | 16.24 | *0.25* | 16.51 | *0.29* | 16.54 | *0.24* | 16.68 | *1.02* | 16.95 | *0.55* | 16.79 | *0.27* | |
| 0.52 | *0.16* | 0.45 | *0.19* | 0.64 | *0.15* | 0.67 | *0.09* | 0.64 | *0.05* | 0.76 | *0.07* | 0.62 | *0.10* | 0.82 | *0.07* | 0.95 | *0.05* | 0.98 | *0.09* | |
| 1.87 | *0.60* | 0.99 | *0.30* | 2.47 | *0.78* | 2.53 | *0.48* | 2.65 | *0.16* | 3.71 | *0.24* | 2.69 | *0.29* | 3.48 | *0.36* | 4.80 | *0.27* | 4.91 | *0.45* | |
| 0.15 | *0.06* | 0.09 | *0.07* | 0.12 | *0.06* | 0.24 | *0.03* | 0.16 | *0.08* | 0.21 | *0.11* | 0.19 | *0.08* | 0.15 | *0.07* | 0.22 | *0.09* | 0.16 | *0.11* | |
| 0.47 | *0.28* | 0.22 | *0.18* | 0.49 | *0.22* | 0.84 | *0.47* | 0.71 | *0.12* | 1.27 | *0.21* | 0.76 | *0.19* | 1.22 | *0.32* | 1.65 | *0.42* | 1.89 | *0.56* | |
| 1.77 | *0.56* | 1.37 | *0.73* | 1.82 | *0.88* | 2.28 | *0.68* | 1.97 | *0.23* | 2.77 | *0.21* | 2.51 | *0.37* | 3.31 | *0.53* | 4.16 | *0.90* | 3.70 | *1.07* | |
| 4.63 | *0.45* | 4.58 | *0.49* | 4.35 | *0.31* | 4.69 | *0.07* | 4.82 | *0.13* | 4.87 | *0.18* | 4.92 | *0.22* | 4.73 | *0.26* | 4.71 | *0.27* | 4.89 | *0.21* | |
| 4.99 | *0.49* | 5.01 | *0.81* | 5.36 | *0.70* | 4.78 | *0.21* | 5.15 | *0.38* | 4.60 | *0.23* | 4.64 | *0.32* | 4.57 | *0.42* | 4.14 | *0.39* | 4.38 | *0.51* | |
| 0.42 | *0.17* | 0.19 | *0.06* | 0.29 | *0.10* | 0.06 | *0.07* | 0.35 | *0.07* | 0.34 | *0.06* | 0.32 | *0.04* | 0.27 | *0.03* | 0.28 | *0.06* | 0.28 | *0.06* | |
| 92.81 |  | 96.23 |  | 95.02 |  | 96.46 |  | 97.79 |  | 99.06 |  | 97.45 |  | 98.04 |  | 97.14 |  | 97.44 |  | |
| *8* |  | *9* |  | *10* |  | *4* |  | *8* |  | *9* |  | *9* |  | *10* |  | *10* |  | *7* |  | |

**Table 4** *(continued)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N-62 |  | N-65 |  | N-68 |  | E-1 |  | E-4 |  | E-5 |  | E-6 |  | E-7 |  | E-8 |  | E-13 | |  |
| avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | | |  |
| 65.98 | *0.27* | 65.78 | *0.45* | 67.64 | *0.25* | 64.65 | *1.14* | 68.26 | *0.24* | 56.26 | *2.66* | 57.41 | *1.03* | 55.63 | *1.80* | 71.17 | *0.56* | 70.09 | *0.38* | |
| 16.33 | *0.16* | 16.44 | *0.27* | 15.89 | *0.14* | 16.69 | *0.24* | 16.06 | *0.10* | 16.11 | *0.98* | 16.61 | *0.32* | 16.76 | *1.86* | 14.77 | *0.20* | 15.04 | *0.10* | |
| 0.81 | *0.07* | 0.69 | *0.06* | 0.62 | *0.08* | 0.77 | *0.09* | 0.44 | *0.07* | 1.05 | *0.27* | 0.99 | *0.22* | 1.09 | *0.19* | 0.46 | *0.06* | 0.55 | *0.08* | |
| 3.31 | *0.22* | 3.06 | *0.22* | 2.90 | *0.12* | 3.77 | *0.47* | 2.29 | *0.08* | 7.94 | *3.94* | 6.43 | *0.94* | 7.51 | *2.36* | 1.69 | *0.22* | 1.89 | *0.09* | |
| 0.18 | *0.10* | 0.12 | *0.08* | 0.12 | *0.07* | 0.13 | *0.09* | 0.15 | *0.10* | 0.31 | *0.12* | 0.38 | *0.08* | 0.33 | *0.07* | 0.18 | *0.13* | 0.18 | *0.14* | |
| 0.78 | *0.06* | 0.82 | *0.10* | 0.84 | *0.08* | 1.23 | *0.23* | 0.62 | *0.05* | 3.23 | *0.80* | 2.73 | *0.70* | 3.46 | *1.51* | 0.35 | *0.15* | 0.46 | *0.08* | |
| 1.78 | *0.14* | 2.14 | *0.26* | 2.17 | *0.18* | 3.04 | *0.43* | 2.13 | *0.06* | 6.64 | *1.71* | 5.85 | *2.21* | 7.10 | *0.80* | 1.63 | *0.18* | 1.58 | *0.10* | |
| 4.89 | *0.23* | 5.20 | *0.11* | 4.77 | *0.07* | 4.58 | *0.28* | 4.66 | *0.15* | 4.25 | *0.38* | 4.64 | *0.41* | 4.19 | *0.42* | 4.51 | *0.09* | 4.64 | *0.13* | |
| 5.35 | *0.15* | 5.21 | *0.19* | 4.82 | *0.09* | 4.53 | *0.17* | 4.74 | *0.09* | 3.19 | *0.47* | 3.68 | *0.67* | 2.98 | *0.27* | 4.79 | *0.17* | 5.01 | *0.17* | |
| 0.45 | *0.13* | 0.36 | *0.09* | 0.41 | *0.03* | 0.35 | *0.05* | 0.42 | *0.12* | 0.27 | *0.06* | 0.35 | *0.03* | 0.33 | *0.12* | 0.37 | *0.04* | 0.35 | *0.02* | |
| 94.92 |  | 96.00 |  | 97.60 |  | 97.21 |  | 97.33 |  | 99.39 |  | 97.13 |  | 97.21 |  | 95.67 |  | 96.81 |  | |
| *8* |  | *10* |  | *10* |  | *9* |  | *10* |  | *10* |  | *4* |  | *7* |  | *15* |  | *8* |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-15 |  | E-19 |  | E-20 |  | E-22 |  | E-25 |  | E-28 |  | E-32 |  | E-35 |  | E-36 |  | E-38 | |  |
| avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | | |  |
| 66.93 | *0.98* | 68.69 | *0.33* | 66.74 | *0.23* | 64.76 | *0.32* | 64.15 | *0.50* | 67.34 | *1.05* | 63.07 | *0.94* | 62.57 | *0.75* | 65.69 | *0.85* | 67.75 | *0.37* | |
| 16.09 | *0.35* | 15.79 | *0.16* | 16.25 | *0.14* | 16.59 | *0.10* | 16.92 | *0.50* | 16.26 | *0.31* | 16.70 | *0.51* | 16.67 | *0.41* | 16.40 | *0.30* | 16.07 | *0.36* | |
| 0.69 | *0.07* | 0.57 | *0.09* | 0.70 | *0.09* | 0.76 | *0.05* | 0.73 | *0.10* | 0.63 | *0.06* | 0.94 | *0.11* | 0.94 | *0.11* | 0.72 | *0.06* | 0.60 | *0.03* | |
| 2.77 | *0.40* | 2.47 | *0.18* | 3.06 | *0.12* | 3.67 | *0.25* | 3.54 | *0.24* | 2.53 | *0.45* | 4.39 | *0.37* | 4.79 | *0.36* | 3.14 | *0.27* | 2.77 | *0.11* | |
| 0.19 | *0.11* | 0.13 | *0.05* | 0.15 | *0.08* | 0.17 | *0.09* | 0.15 | *0.08* | 0.09 | *0.07* | 0.12 | *0.11* | 0.22 | *0.08* | 0.18 | *0.11* | 0.17 | *0.09* | |
| 0.84 | *0.18* | 0.72 | *0.11* | 0.98 | *0.04* | 1.18 | *0.10* | 1.13 | *0.09* | 0.60 | *0.28* | 1.25 | *0.08* | 1.78 | *0.26* | 0.76 | *0.12* | 0.78 | *0.07* | |
| 2.46 | *0.39* | 1.95 | *0.11* | 2.21 | *0.05* | 2.71 | *0.08* | 3.09 | *0.48* | 2.18 | *0.37* | 3.04 | *0.53* | 3.21 | *0.31* | 2.05 | *0.26* | 2.09 | *0.23* | |
| 4.80 | *0.24* | 4.69 | *0.18* | 4.94 | *0.10* | 5.29 | *0.12* | 5.14 | *0.13* | 5.06 | *0.26* | 4.90 | *0.19* | 4.89 | *0.10* | 5.13 | *0.27* | 4.89 | *0.17* | |
| 4.70 | *0.28* | 4.79 | *0.21* | 4.96 | *0.07* | 4.46 | *0.08* | 4.41 | *0.29* | 4.86 | *0.35* | 4.78 | *0.36* | 4.70 | *0.17* | 5.20 | *0.28* | 4.82 | *0.22* | |
| 0.36 | *0.05* | 0.38 | *0.07* | 0.31 | *0.07* | 0.44 | *0.06* | 0.35 | *0.06* | 0.30 | *0.10* | 0.28 | *0.09* | 0.29 | *0.03* | 0.41 | *0.10* | 0.36 | *0.05* | |
| 97.81 |  | 97.58 |  | 97.63 |  | 97.81 |  | 98.51 |  | 97.84 |  | 96.36 |  | 98.03 |  | 96.67 |  | 96.99 |  | |
| *9* |  | *10* |  | *5* |  | *10* |  | *10* |  | *9* |  | *8* |  | *8* |  | *9* |  | *10* |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E-41 |  | E-42 |  | E-49 |  | Kawakawa | |  | E-52 |  | E-56 |  | E-64 |  | E-68 |  | E-71 |  | Okaia | |  |
| avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | avg. | *±S.D.* | | |  |
| 68.14 | *0.86* | 63.31 | *1.32* | 62.42 | *1.70* | 77.47 | *0.33* | | 60.43 | *0.86* | 59.38 | *1.73* | 63.17 | *1.09* | 60.66 | *0.77* | 61.27 | *1.09* | 77.20 | *0.15* | |
| 15.45 | *0.28* | 17.01 | *0.54* | 16.41 | *0.97* | 12.59 | *0.08* | | 16.53 | *0.73* | 16.61 | *0.93* | 16.79 | *0.46* | 16.54 | *0.77* | 16.42 | *0.65* | 12.38 | *0.10* | |
| 0.59 | *0.05* | 0.84 | *0.14* | 0.91 | *0.17* | 0.17 | *0.06* | | 1.12 | *0.25* | 1.20 | *0.20* | 0.85 | *0.07* | 0.92 | *0.14* | 0.95 | *0.08* | 0.20 | *0.08* | |
| 2.73 | *0.21* | 4.17 | *0.63* | 4.77 | *1.37* | 1.23 | *0.09* | | 5.92 | *1.00* | 6.01 | *0.90* | 4.48 | *0.90* | 5.90 | *0.57* | 5.48 | *0.77* | 1.56 | *0.09* | |
| 0.16 | *0.13* | 0.18 | *0.13* | 0.20 | *0.08* | -0.02 | *0.04* | | 0.20 | *0.08* | 0.14 | *0.09* | 0.21 | *0.12* | 0.27 | *0.10* | 0.27 | *0.10* | 0.05 | *0.07* | |
| 0.61 | *0.18* | 1.37 | *0.37* | 1.69 | *0.63* | 0.13 | *0.09* | | 1.58 | *0.32* | 1.82 | *0.83* | 1.17 | *0.45* | 2.04 | *0.46* | 1.86 | *0.80* | 0.15 | *0.07* | |
| 1.91 | *0.30* | 3.37 | *0.49* | 3.49 | *0.76* | 1.21 | *0.05* | | 3.74 | *0.57* | 4.44 | *1.01* | 3.05 | *0.28* | 3.73 | *0.70* | 3.65 | *0.39* | 1.18 | *0.10* | |
| 4.79 | *0.13* | 5.10 | *0.31* | 5.06 | *0.53* | 3.84 | *0.20* | | 4.94 | *0.19* | 5.01 | *0.28* | 5.08 | *0.16* | 5.10 | *0.12* | 4.99 | *0.23* | 3.67 | *0.19* | |
| 4.97 | *0.19* | 4.01 | *0.28* | 3.99 | *0.51* | 3.16 | *0.16* | | 4.53 | *0.27* | 4.42 | *0.69* | 4.42 | *0.33* | 3.94 | *0.27* | 4.05 | *0.33* | 3.27 | *0.31* | |
| 0.39 | *0.06* | 0.27 | *0.03* | 0.27 | *0.11* | 0.26 | *0.05* | | 0.39 | *0.04* | 0.32 | *0.06* | 0.39 | *0.08* | 0.40 | *0.07* | 0.32 | *0.10* | 0.27 | *0.04* | |
| 97.46 |  | 100.01 |  | 99.02 |  | 92.12 |  | | 98.75 |  | 99.18 |  | 98.64 |  | 104.62 |  | 104.59 |  | 98.69 |  | |
| *10* |  | *8* |  | *10* |  | *10* |  | | *10* |  | *9* |  | *9* |  | *9* |  | *10* |  | *11* |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| E-76 |  | E-79 |  |
| avg. | *±S.D.* | avg. | *±S.D.* |  |
| 64.36 | *0.31* | 69.22 | *0.69* |
| 16.89 | *0.17* | 15.52 | *0.26* |
| 0.80 | *0.06* | 0.57 | *0.07* |
| 3.89 | *0.14* | 2.51 | *0.29* |
| 0.19 | *0.11* | 0.15 | *0.03* |
| 1.26 | *0.10* | 0.52 | *0.14* |
| 2.75 | *0.09* | 1.69 | *0.19* |
| 4.98 | *0.20* | 5.02 | *0.22* |
| 4.33 | *0.09* | 4.33 | *0.19* |
| 0.24 | *0.03* | 0.35 | *0.06* |
| 98.37 |  | 101.76 |  |
| *9* |  | *8* |  |

*Note: Glass analyses are normalized to 100% volatile free. All Fe reported as FeOtotal. Mean and one standard deviation based on n (number of analyses per tephra). The complete compositional datasheet is available from the author*.