

Additional File 1

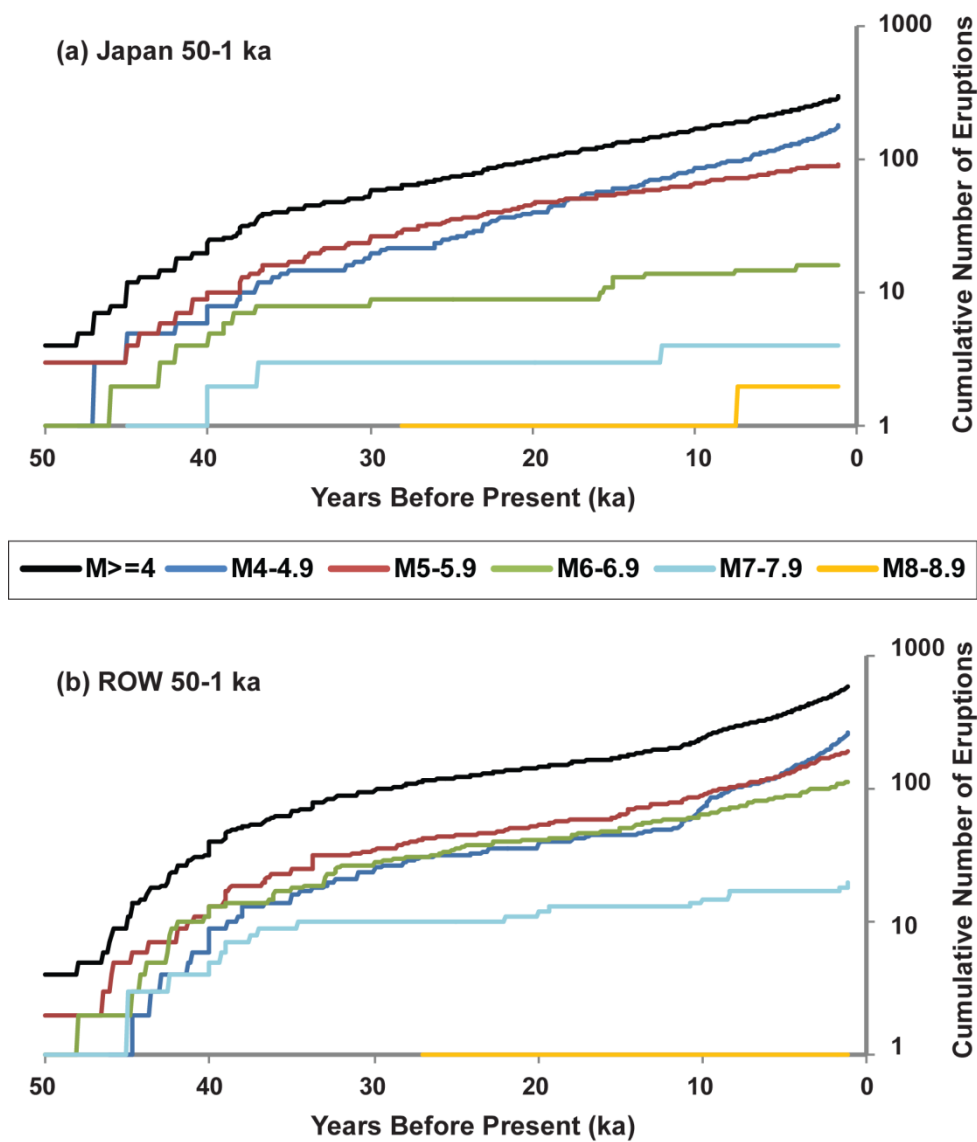


Figure Sup-1: Cumulative number of eruptions from 50 to 1 ka for (a) JTM and (b) ROW datasets.

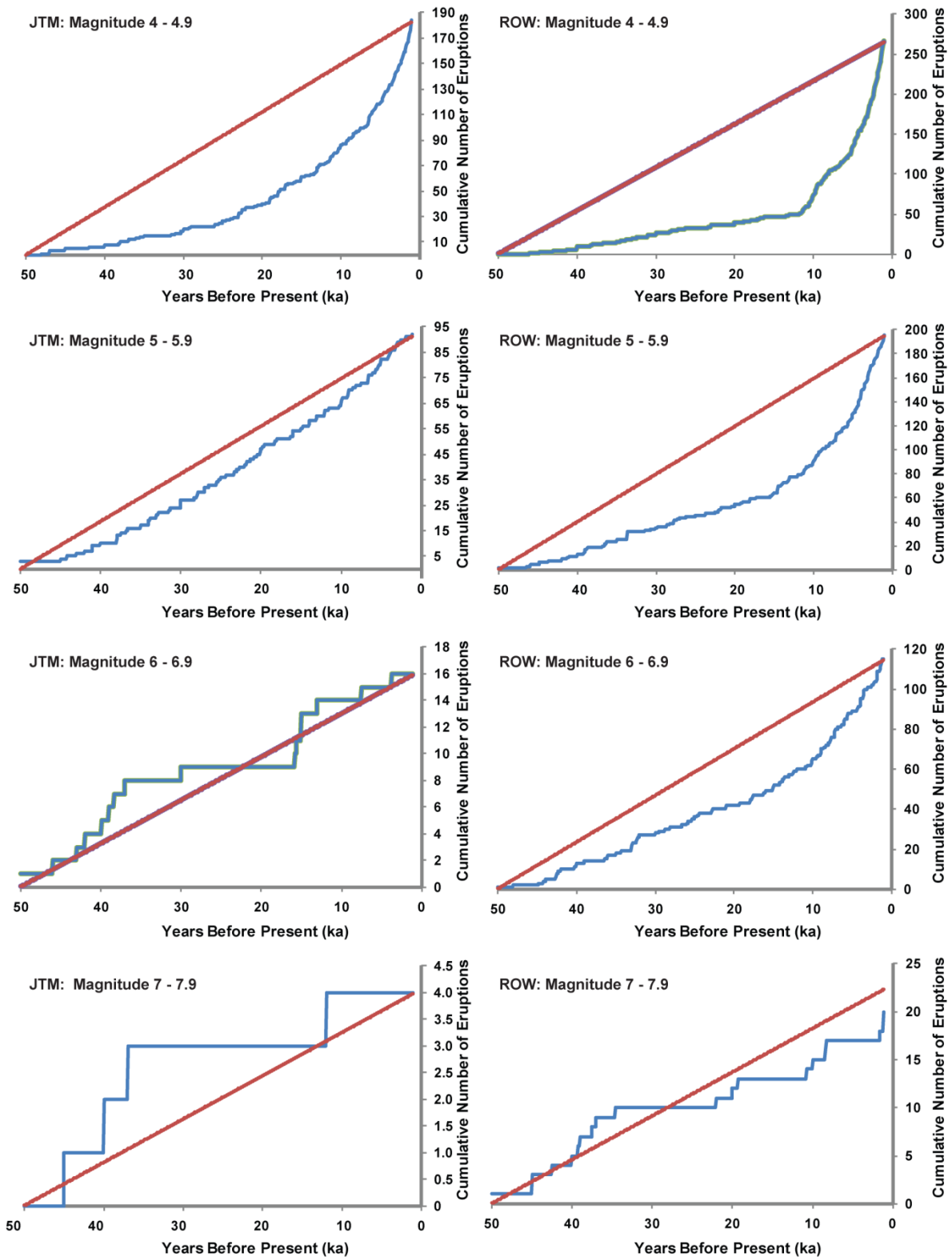


Figure Sup-2: A comparison between the number of expected and actual recorded eruptions for JTM and ROW. The expected (red line) cumulative number of eruption records if volcanic activity was both uniform and fully recorded, and the actual (blue line) record of eruptions of magnitude intervals 4 to 7 for the Japan, Taiwan and Marianas region (JTM) and the rest of world (ROW). Results are shown up to 1 ka to focus solely on the geologic record.

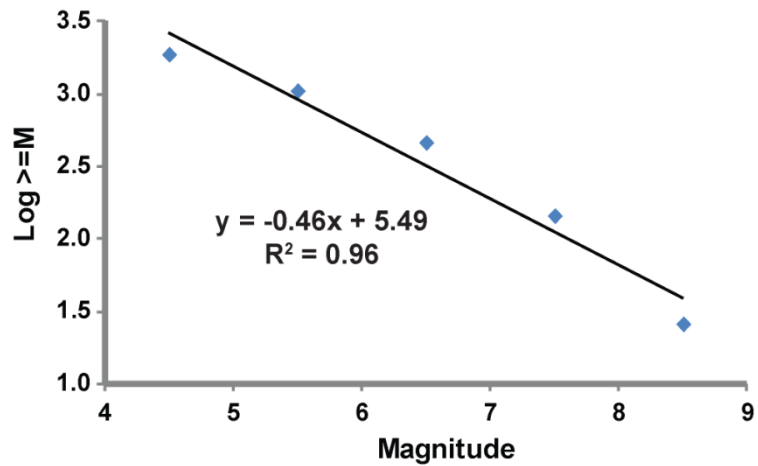


Figure Sup-3: Log of number of eruptions $\geq M$ against magnitude, producing the B-value of 0.46 for the global dataset.

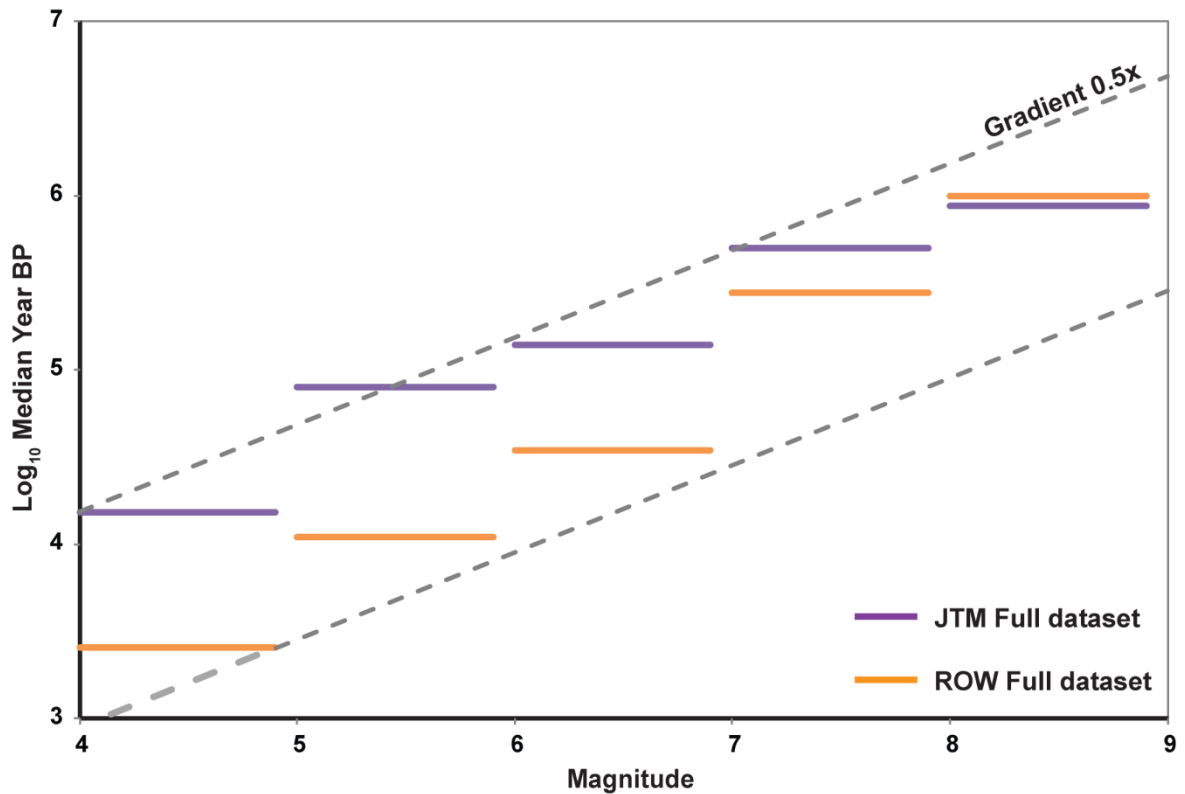


Figure Sup-4: Log of median time for eruptions in each magnitude bin for JTM and ROW datasets. The full dataset inclusive of historical data (i.e. 2.5 Ma to 2013 AD) is shown. The increased divergence between the lines at lower magnitudes is illustrative of the superior eruption record in the JTM region for these events.

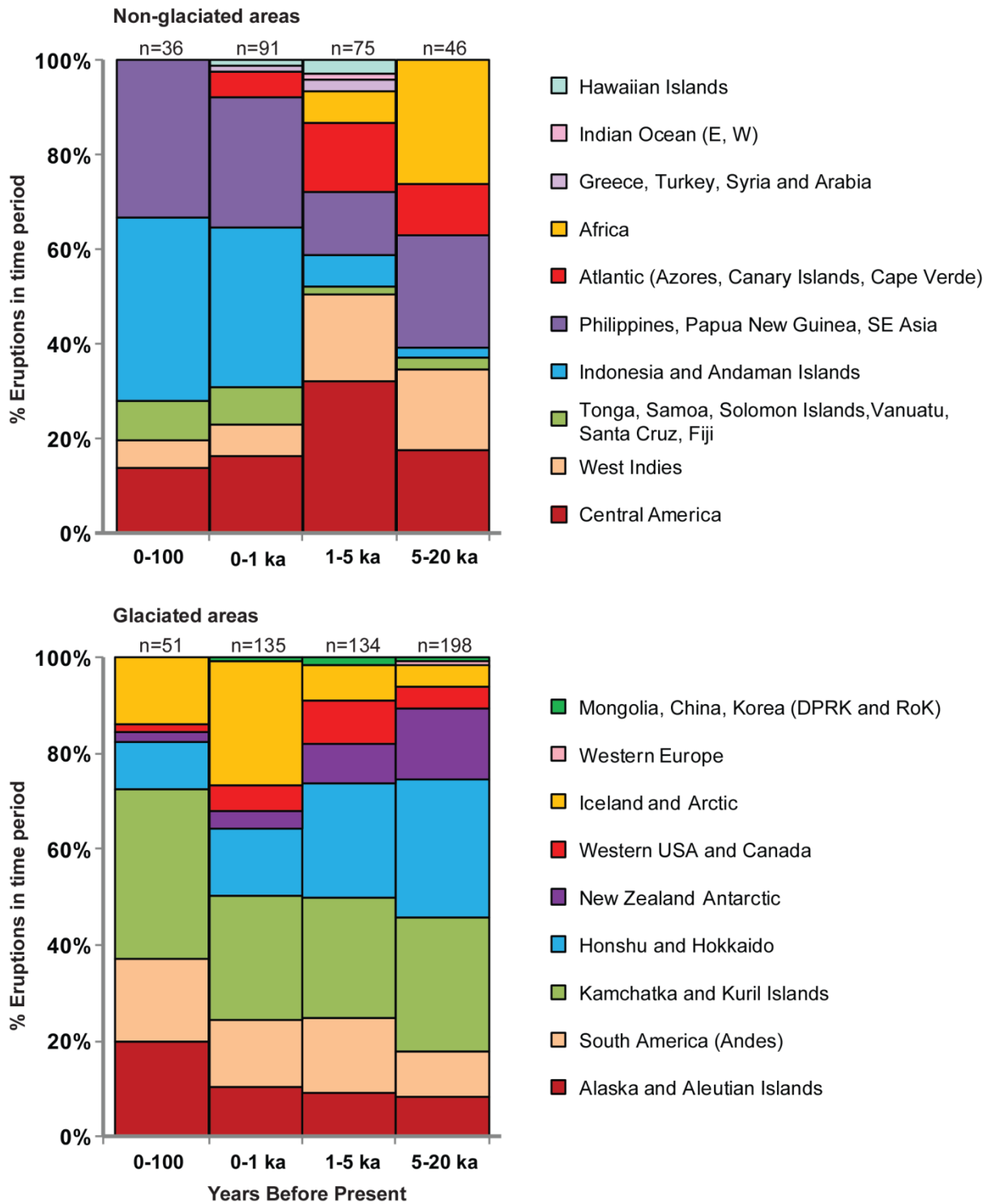


Figure Sup-5: The number of eruptions in selected regions as a proportion of the record in set time periods. Sub-regions are selected from non-glaciated (top) and glaciated (bottom) areas following the analysis of Watt et al. (2013). The number of eruptions are analysed across the glacial to Holocene, illustrating spatial bias in a variable eruption record.

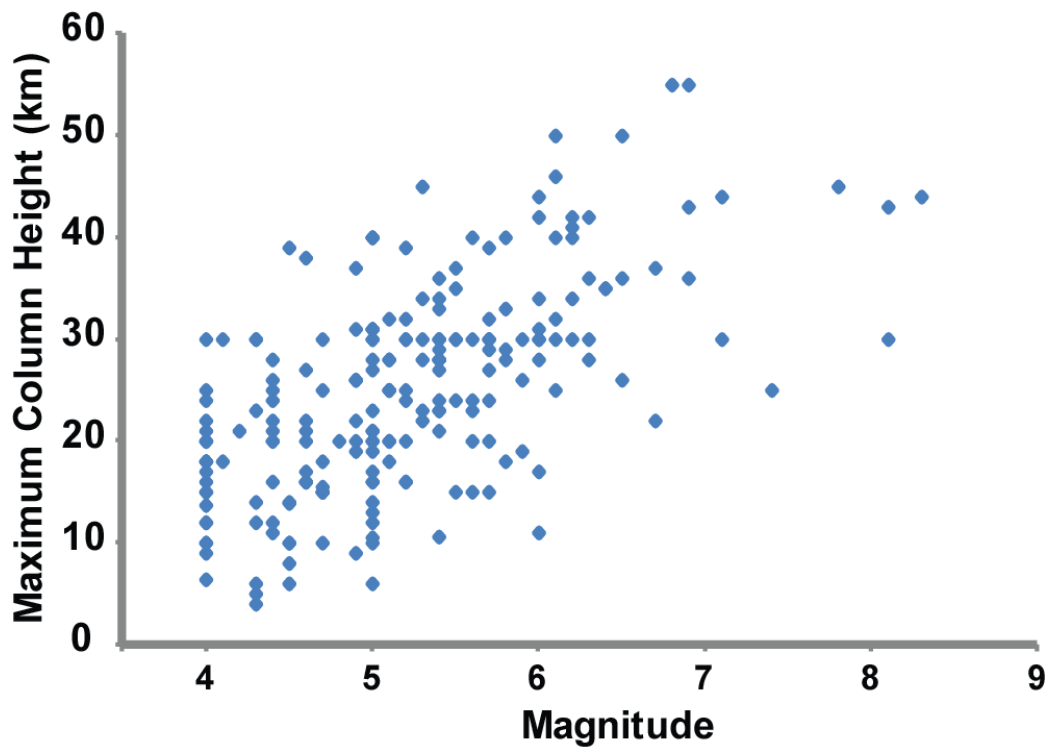


Figure Sup-6: Eruption column heights versus magnitude for all eruptions with a recorded column height. The eruption of the Younger Toba Tuff is excluded here because of the disputed maximum column height.

Table Sup-1: Median age of eruptions of each magnitude interval by region. The age is shown as years BP and *n* is number of eruptions.

| Region | M4-4.9 | M5-5.9 | M6-6.9 | M7-7.9 | M8-8.9 |
|------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | Median age (<i>n</i>) | Median age (<i>n</i>) | Median age (<i>n</i>) | Median age (<i>n</i>) | Median age (<i>n</i>) |
| Mediterranean and W Asia | 21,451 (40) | 142,000 (38) | 107,500 (39) | 76,500 (8) | |
| Africa and Red Sea | 38,000 (17) | 14,405 (7) | 11,603 (6) | 370,000 (2) | 1,000,000 (1) |
| Middle East and Indian Ocean | 142,500 (2) | 188,000 (3) | 123,500 (2) | | |
| New Zealand to Fiji | 5,585 (38) | 29,137 (30) | 33,000 (23) | 440000 (16) | 1,000,000 (7) |
| Melanesia and Australia | 1,260 (44) | 18,050 (9) | 5,152 (16) | 10122 (2) | |
| Indonesia | 136 (28) | 317 (8) | 9,967 (6) | 166000 (6) | 840,000 (3) |
| Philippines and SE Asia | 218 (12) | 405 (2) | 5,892 (6) | 37500 (1) | |
| Japan, Taiwan, Marianas | 15,350 (312) | 80,000 (267) | 139,200 (97) | 500000 (41) | 870,000 (11) |
| Kuril Islands | 52 (12) | 21,850 (2) | 40,000 (3) | 27825 (4) | |
| Kamchatka and Mainland Asia | 6,407 (72) | 4,265 (44) | 42,000 (23) | 42410 (11) | |
| Alaska | 3,910 (26) | 3,872 (8) | 6,286 (18) | 52975 (2) | |
| Canada and Western USA | 1,925 (18) | 23,500 (26) | 66,750 (8) | 1186000 (10) | 760,000 (3) |
| Hawaii and Pacific Ocean | 2,079 (3) | | | | |
| México and Central America | 2,571 (62) | 18,510 (44) | 58,950 (28) | 179500 (8) | |
| South America | 1,770 (82) | 10,528 (61) | 36,283 (22) | 450000 (7) | 2200000 (1) |
| West Indies | 2,513 (31) | 4,6465 (1) | 36,385 (3) | | |
| Iceland and Arctic Ocean | 510 (37) | 1,080 (19) | 10,180 (1) | | |
| Atlantic Ocean | 4,233 (13) | 19,623 (16) | 110,346 (12) | | |
| Antarctica | 162,600 (4) | 92,500 (5) | 18,000 (3) | 1700000 (1) | |

Table Sup-2: Glaciated and non-glaciated regions used in analysis (after Huybers and Langmuir 2009 and Watt et al. 2013).

| Region | Glaciated/Non-glaciated |
|--|--------------------------------|
| Alaska & Aleutian Islands | Glaciated |
| Antarctica | Glaciated |
| Pacific (NE) | Glaciated |
| Atlantic (S) | Glaciated |
| Caucasus, Georgia, Armenia | Glaciated |
| Canada | Glaciated |
| Southern Andes (Chile, Bolivia, Argentina) | Glaciated |
| Colombia | Glaciated |
| USA (exc.Alaska and Hawaii) | Glaciated |
| Iceland | Glaciated |
| Western Europe | Glaciated |
| New Zealand | Glaciated |
| Australia | Glaciated |
| Japan (Honshu, Hokkaido) | Glaciated |
| Kuril Islands | Glaciated |
| Mongolia | Glaciated |
| China (W, E) | Glaciated |
| Korea | Glaciated |
| Russia (inc.Kamchatka) | Glaciated |
| Africa | Non-glaciated |
| Arabia | Non-glaciated |
| Azores | Non-glaciated |
| Canary Islands | Non-glaciated |
| Cape Verde | Non-glaciated |
| Greece | Non-glaciated |
| Indonesia | Non-glaciated |
| Hawaiian Islands | Non-glaciated |
| Turkey | Non-glaciated |
| Syria | Non-glaciated |
| Indian Ocean (W, E) | Non-glaciated |
| Papua New Guinea | Non-glaciated |
| Philippines and SE Asia | Non-glaciated |
| Tonga, Samoan and Wallis Islands, Solomon Islands, Vanuatu, Fiji, Santa Cruz, | Non-glaciated |
| Andaman Islands | Non-glaciated |
| West Indies | Non-glaciated |
| Central America | Non-glaciated |