**S2 APPENDIX**

We estimated equations to correct the surface temperature for the topographic effects obtained from polynomial regressions of the raw temperature with altitude *h,* ($\hat{T}\_{h}$) and with the aspect *a*, ($\hat{T}\_{a}$). The corrected surface temperature was Tc = TR – (ΔT*h* + ΔT*a)*, where TR is the raw surface temperature, ΔT*h* and ΔT*a* are the differences of TR to the reference surface temperature averaged each FAAI interval, with the reference for altitude taken at 850 m and for aspect at 45o, respectively. The differences were estimated with statistical polynomial fitting that used data at discrete intervals of every 50 m for the altitude (Table 1), 20° for the aspect (List 1) and 10% for the FAAI variation, respectively. In summary the differences were calculated as ΔTh =$\hat{T}\_{h,FAAI}-\overbar{T}\_{850m,FAAI}$, where $\overbar{T}\_{850m,FAAI}$ is the average temperature at 850 m each FAAI interval; and ΔTa =$ \hat{T}\_{a,FAAI}-\overbar{T}\_{45°,FAAI}$. where $\overbar{T}\_{45°,FAAI}$ is the average temperature at 45° each FAAI interval. Corrections were applied to all data at 120 m res for different combinations of *h* and FAAI, and *a* and FAAI.

**Table 1.** Equations fitted for altitudinal variation and dependence on FAAI (taken at the middle interval, in %): $\hat{T}\_{h}$ (°C) = b (°C⋅100m-1) ∙ h (altitude, m) + a (°C).

|  |  |  |  |
| --- | --- | --- | --- |
| **FAAI (%)** | $$\hat{T}\_{h}$$ | **R2** | **p-value** |
| 5 | -0.39 h + 23.7 | 0.97 | 5.8e-12 |
| 15 | -0.46 h + 25.2 | 0.97 | 6.8e-12 |
| 25 | -0.43 h + 25.2 | 0.96 | 2.9e-11 |
| 35 | -0.44 h + 25.6 | 0.98 | 3.9e-13 |
| 45 | -0.46 h + 26.1 | 0.96 | 8.0e-11 |
| 55 | -0.43 h + 25.9 | 0.94 | 2.0e-10 |
| 65 | -0.48 h + 26.7 | 0.91 | 7.3e-09 |
| 75 | -0.44 h + 26.6 | 0.89 | 3.8e-08 |
| 85 | -0.52 h + 27.8 | 0.93 | 3.6e-09 |
| 95 | -0.43 h + 28.0 | 0.95 | 1.9e-09 |

**List 1:** Equations fitted for variation of aspect, *a*, and dependence on FAAI (taken at the middle interval, in %) $\hat{T}\_{a}$ (°C) = f (*a n*) as a polynomial fitting (degree n = 4 or 5),with $\hat{T}\_{a}$ = y and *a* = x as following**:**

**5%:** y = 1.61779094∙10-12x5 – 2.33860247606∙10-9x4 + 1.25591999175501∙10-6x3 - 2.66671263506879∙10-4x2 + 0.0153885560872595x + 20.0653840278255
R² = 0.98, p-value: < 2.2e-16

**15%:** y = -3.0794805345∙10-10x4 + 4.6282823936653∙10-7x3 – 1∙53386952271406∙10-4x2 + 9∙666318403319∙10-3x + 21.0685572245873

R² = 0.84, p-value: 4.2e-12

**25%:** y = -5∙0863959982∙10-10x4 + 6∙0917545530951∙10-7x3 – 1.97423557920073∙10-4x2 + 0.0159021036803466x + 21.0782574462278

R² = 0.86, p-value: 3.9e-13

**35%:** y = 5.3821748∙10-13x5 – 8.6679154994∙10-10x4 + 7.0215619042691∙10-7x3 - 2.0418966137292200∙10-4x2 + 0.0133777521406273x + 21.7643771919129

R² = 0.82, p-value: 1.8e-10

**45%:** y = -2.2904374004∙10-10x4 + 3.9021701365993∙10-7x3 - 1.3378135853359110-4x2 + 7.11410447819105∙10-3x + 22.0576792587603

R² = 0.83, p-value: 1.4e-11

**55%:** y = -7.89856874∙10-12x5 + 6.27778052893∙10-9x4 – 1.40461724204566∙10-6x3 + 4.84932614366329∙10-5x2 + 3.03868257719841∙10-3x + 22.1601707704622

R² = 0.84, p-value: 2.1e-11

**65%:** y = -7.1582855494∙10-10x4 + 7.3249347776281∙10-7x3 – 2.01722512451319∙10-4x2 + 9.69801123460456∙10-3x + 22.6333937871236

R² = 0.93, p-value: < 2.2e-16

**75%:** y = -4.44808908∙10-12x5 + 2.69906430718∙10-9x4 – 5.213565860973∙10-8x3 – 1.63693355725414∙10-4x2 + 0.0135403068244386x + 22.8101181285683

R² = 0.91, p-value: < 2.9e-15

**85%:** y = -2.98502355∙10-12x5 + 8.3204818832∙10-10x4 + 8.1961142721354∙10-7x3 – 3.47578242561042∙10-4x2 + 2.98496198269049∙10-2x + 22.7277314181438

R² = 0.91, p-value: < 3.2e-15

**95%:** y = -5.33250272∙10-12x5 + 2.77711614452∙10-9x4 + 3.3896235911157∙10-7x3 – 3.03409602835814∙10-4x2 + 2.47593032436271∙10-2x + 24.154206900288

R² = 0.97, p-value: < 2.2e-16