



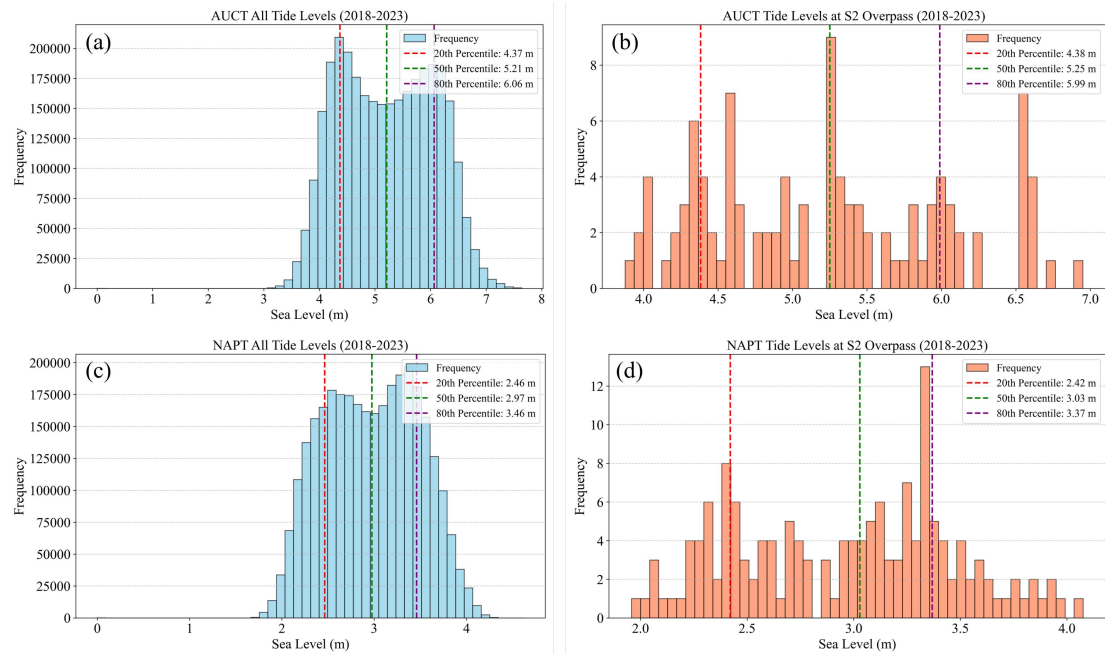
Supplement of

NZ-BeachTopo30: a national-scale and full-coverage 30 m beach topography dataset for New Zealand reconstructed by fusing ICESat-2 and Sentinel-2

Yuhao Wang et al.

Correspondence to: Nan Xu (xunan2025@szu.edu.cn)

The copyright of individual parts of the supplement might differ from the article licence.



10 **Fig. S1. Frequency histograms of tidal levels comparing continuous full-tidal records and Sentinel-2 (S2) overpass moments. Panels (a) and (b) represent the total observed tide level frequency histogram and the S2 observed tide level frequency histogram for the AUCT (Auckland) tide gauge station, respectively. Similarly, panels (c) and (d) display the total observed tide level frequency histogram and the S2 observed tide level frequency histogram for the NAPT (Napier) tide gauge station. The dashed vertical lines indicate the 20th, 50th, and 80th percentiles.**

15

20

25

30 **Table S1.** The recorded values corresponding to the three percentiles (20th, 50th, and 80th) of the total continuous observations and the S2 overpass times across 12 representative tide gauge stations in New Zealand (2018–2023). This table also lists the geographic coordinates (longitude and latitude) where each station is located. The 12 analyzed stations are: AUCT (Auckland), CHIT (Chatham Islands), CPIT (Castlepoint), GBIT (Great Barrier Island), GIST (Gisborne), KAIT (Kaikoura), LOTT (Lottin Point), NAPT (Napier), OTAT (Port Chalmers), PUYT (Puysegur Point), TAUT (Tauranga), and WLGT (Wellington).

| Station | Continuous tidal record (m) | | | Sentinel-2 overpass (m) | | | Lon (°) | Lat (°) |
|---------|-----------------------------|------|------|-------------------------|------|------|---------|---------|
| | 20p | 50p | 80p | 20p | 50p | 80p | | |
| AUCT | 4.37 | 5.21 | 6.06 | 4.38 | 5.25 | 5.99 | 174.79 | -36.83 |
| CHIT | 2.22 | 2.57 | 2.96 | 2.21 | 2.50 | 2.82 | -176.37 | -44.02 |
| CPIT | 2.51 | 3.55 | 4.34 | 2.45 | 3.65 | 4.30 | 176.23 | -40.90 |
| GBIT | 5.20 | 5.78 | 6.44 | 5.14 | 5.73 | 6.31 | 175.49 | -36.19 |
| GIST | 3.41 | 3.88 | 4.37 | 3.50 | 3.83 | 4.31 | 178.02 | -38.68 |
| KAIT | 1.49 | 2.00 | 2.54 | 1.40 | 1.89 | 2.49 | 173.70 | -42.41 |
| LOTT | 2.99 | 3.54 | 4.06 | 3.02 | 3.59 | 4.12 | 178.16 | -37.55 |
| NAPT | 2.46 | 2.97 | 3.46 | 2.42 | 3.03 | 3.37 | 176.92 | -39.48 |
| OTAT | 3.83 | 4.39 | 5.00 | 3.83 | 4.29 | 4.78 | 170.63 | -45.81 |
| PUYT | 5.78 | 6.37 | 6.96 | 5.79 | 6.29 | 6.78 | 166.59 | -46.08 |
| TAUT | 4.37 | 4.94 | 5.47 | 4.41 | 4.98 | 5.49 | 176.18 | -37.64 |
| WLGT | 2.52 | 2.88 | 3.29 | 2.53 | 2.86 | 3.21 | 174.78 | -41.28 |

35

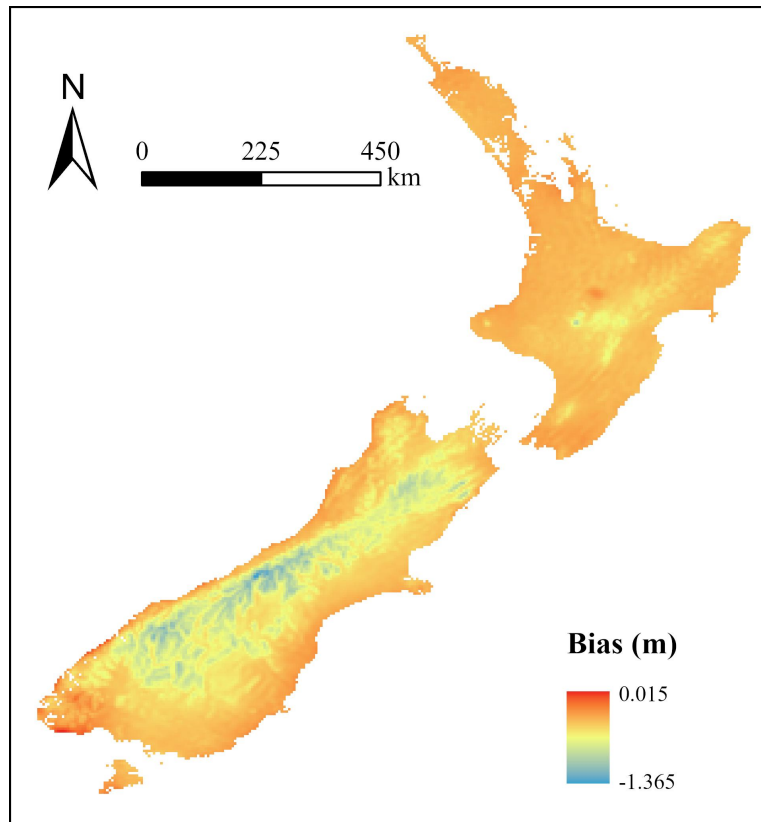


Fig. 2. Spatial distribution of the offset ($N_{EGM2008} - N$) between EGM2008 and NZGeoid2016 across New Zealand. The offset ranges from -1.365 m to 0.015 m. Coastal beach areas show offsets close to zero.