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## Supplement of

## Updates to C-LSAT 2.1 and the development of high-resolution land surface air temperature and diurnal temperature range datasets

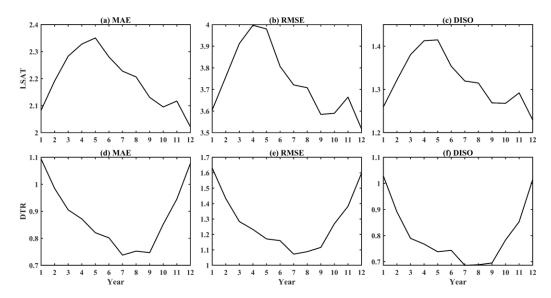
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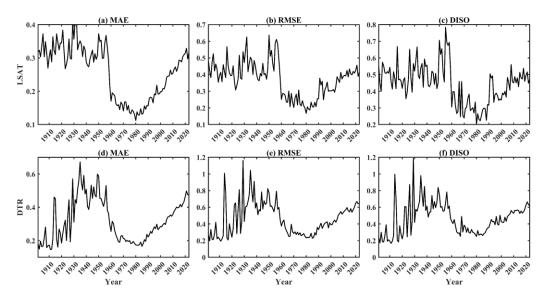
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**Table S1.** Tavg temporal coverage of observation stations at both annual and monthly scales.

| Months    | Temporal coverage (%) |       |        |       |
|-----------|-----------------------|-------|--------|-------|
|           | 20–50                 | 50-80 | 80–100 | >100  |
| January   | 20.52                 | 45.82 | 9.25   | 21.80 |
| February  | 20.40                 | 45.80 | 9.42   | 21.90 |
| March     | 20.32                 | 45.64 | 9.54   | 21.88 |
| April     | 20.45                 | 45.52 | 9.39   | 21.97 |
| May       | 20.17                 | 45.66 | 9.36   | 22.01 |
| June      | 20.34                 | 45.51 | 9.40   | 21.91 |
| July      | 20.27                 | 45.34 | 9.46   | 21.88 |
| August    | 20.15                 | 45.50 | 9.38   | 21.91 |
| September | 20.28                 | 45.49 | 9.54   | 21.88 |
| October   | 19.98                 | 45.67 | 9.51   | 22.03 |
| November  | 19.99                 | 45.80 | 9.58   | 21.95 |
| December  | 20.24                 | 45.61 | 9.57   | 21.85 |
| All       | 24.07                 | 42.49 | 9.16   | 18.36 |



**Figure S1.** MAE, RMSE, and DISO validation results of the climatology fields over the Tibetan Plateau for C-LSAT HRv1 (a–c) and C-LDTR HRv1 (d–f).



**Figure S2.** MAE, RMSE, and DISO validation results of the anomaly fields over the Tibetan Plateau for C-LSAT HRv1 (a–c) and C-LDTR HRv1 (d–f).