

*Earth’s Future*

Supporting Information for

**Past, Present and Future Pacific Sea Level Change**

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**Estimation of Trends**

Linear trends were estimated over different time periods using least squares. To adequately account for serial correlation of the residuals in the trend estimates, we follow the procedure from *Haigh et al.* (2014) and reduce the degrees of freedom to compute the uncertainty associated with the trend estimates. In the case of the 10-year trends, we subset a 10-year portion of the available record, estimate the linear trend, and then set the trend estimate at the midpoint of that 10-year record. This leads to a loss of 5 years at each end of the time series. To estimate the evolution of the full-record trend, we use a starting point of 1993 (1950 in the case of the tide gauge estimate), successively add a month of data from this starting point, and compute the linear trend with the shortened record length. This process is repeated until the last linear trend estimate is the full-record estimate from the satellite altimetry data covering the time period from 1993 to 2019.

Chart, line chart

Description automatically generated

Figure S1. For the time period from 1950 to 2019, trend evolution as estimated from available tide gauge data. For this figure, the start-date for the trend evolution computation is 1950, and x-axis indicates end-date for trend estimate. The last data point is therefore the trend from 1950 to 2019 and first data point is the trend from 1950 to 1965. Full-record trend and acceleration have been removed prior to computing trend evolution.

Table S1. Information for tide gauges used in the two regions of interest. Although the time period covered by the tide gauges extends prior to 1950, but the information below covers only the time period of interest.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tide Gauge Name | Region | Longitude | Longitude | Time Period Covered | Record Completeness (%) |
| San Francisco | U.S. West Coast | 237.5 | 37.8 | 1950-2019 | 100 |
| San Diego | U.S. West Coast | 242.8 | 32.7 | 1950-2019 | 98 |
| Los Angeles | U.S. West Coast | 241.7 | 33.7 | 1950-2019 | 98 |
| La Jolla | U.S. West Coast | 242.7 | 32.9 | 1950-2019 | 97 |
| Santa Monica | U.S. West Coast | 241.5 | 34.0 | 1950-2019 | 87 |
| Crescent City | U.S. West Coast | 235.8 | 41.7 | 1950-2019 | 98 |
| Alameda | U.S. West Coast | 237.7 | 37.7 | 1950-2019 | 99 |
| Port San Luis | U.S. West Coast | 239.2 | 35.2 | 1950-2019 | 94 |
| Manila | Western Tropical Pacific | 121.0 | 14.6 | 1950-2019 | 96 |
| Cebu | Western Tropical Pacific | 123.9 | 10.3 | 1950-2019 | 85 |
| Legaspi | Western Tropical Pacific | 123.8 | 13.2 | 1950-2019 | 93 |
| Apra Harbor | Western Tropical Pacific | 144.7 | 13.4 | 1950-2019 | 93 |

Table S2: CMIP6 model runs used in this study

|  |  |  |
| --- | --- | --- |
| Model name | Reference DOI | Provides natural-forcing only historical run |
| ACCESS-CM2 | <https://doi.org/10.22033/ESGF/CMIP6.2281> |  |
| ACCESS-ESM1-5 | <https://doi.org/10.22033/ESGF/CMIP6.2288> | x |
| CanESM5 | <https://doi.org/10.22033/ESGF/CMIP6.1301> | x |
| CMCC-CM2-SR5 | [https://doi.org/10.22033/ESGF/CMIP6.3896](http://doi.org/10.22033/ESGF/CMIP6.3896) |  |
| CNRM-CM6-1-HR | <https://doi.org/10.22033/ESGF/CMIP6.1388> |  |
| CNRM-ESM2-1 | <https://doi.org/10.22033/ESGF/CMIP6.1391> |  |
| EC-Earth3 | <https://doi.org/10.22033/ESGF/CMIP6.181> |  |
| GISS-E2-1-G | <https://doi.org/10.22033/ESGF/CMIP6.1400> | x |
| IPSL-CM6A-LR | <https://doi.org/10.22033/ESGF/CMIP6.1534> | x |
| MIROC6 | <https://doi.org/10.22033/ESGF/CMIP6.881> |  |
| MPI-ESM1-2-HR | <https://doi.org/10.22033/ESGF/CMIP6.741> |  |
| MPI-ESM1-2-LR | <https://doi.org/10.22033/ESGF/CMIP6.742> |  |
| MRI-ESM2 | <https://doi.org/10.22033/ESGF/CMIP6.621> |  |
| NorESM2-LM | <https://doi.org/10.22033/ESGF/CMIP6.604> | x |
| NorESM2-MM | <https://doi.org/10.22033/ESGF/CMIP6.506> |  |
| UKESM1-0-LL | <https://doi.org/10.22033/ESGF/CMIP6.2245> |  |