

Data Repository for:  
**Contribution of buoyancy fluxes to tropical Pacific sea level variability**  
Patrick Wagner, Markus Scheinert, and Claus W. Böning

If you have any further questions regarding this data or the simulations used in the study, or want to have access to more datasets, please contact [fb1-od-data@geomar.de](mailto:fb1-od-data@geomar.de)

Whenever using this data, please cite:  
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Data needed to reproduce the figures in the study can be found in this repository. All files are in netCDF4 format. For each figure, there is a directory, that contains all data needed to plot it. Note that we do not include any third party data in this repository.

The altimetry observations shown in Figure 1 are provided by E.U. Copernicus Marine Service (CMEMS).  
[https://resources.marine.copernicus.eu/?option=com\\_csw&view=details&product\\_id=SEALEVEL\\_GLO\\_PHY\\_L4\\_REP\\_OBSERVATIONS\\_008\\_047](https://resources.marine.copernicus.eu/?option=com_csw&view=details&product_id=SEALEVEL_GLO_PHY_L4_REP_OBSERVATIONS_008_047)

If you have any questions concerning the simulations, please refer to them by their original names as listed below:

- 0025-HC = ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast**
- 0025-B90 = ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90**
- 0025-W90 = ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90**
- 0025-RYF90 = ORCA025.L46.LIM2vp.JRA.XIOS2.RAF-KPW001**

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A detailed list of files together with a description of the contents is given below.

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**FIGURE01**

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_sossheig\_box1.nc**  
SSH anomalies (m) from 0025-HC averaged over the domain 0°N-20°N, 130°E-150°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_sossheig\_box2.nc**  
SSH anomalies (m) from 0025-HC averaged over the domain 20°S-5°S, 159°E-179°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_sossheig\_box3.nc**  
SSH anomalies (m) from 0025-HC averaged over the domain 7°S-3°S, 210°E-240°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_sossheig\_standard\_deviation.nc**  
Standard deviation of SSH (m), based on yearly averages from 0025-HC

**FIGURE02**

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_sossheig\_standard\_deviation.nc**  
Standard deviation of SSH (m) from 0025-HC. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_standard\_deviation.nc**  
Standard deviation of halosteric SSH (m) from 0025-HC. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_standard\_deviation.nc**  
Standard deviation of steric SSH (m) from 0025-HC. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_standard\_deviation.nc**  
Standard deviation of thermosteric SSH (m) from 0025-HC. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_sossheig\_standard\_deviation.nc**  
Standard deviation of SSH (m) from 0025-B90. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_standard\_deviation.nc**  
Standard deviation of halosteric SSH (m) from 0025-B90. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_standard\_deviation.nc**  
Standard deviation of steric SSH (m) from 0025-B90. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_standard\_deviation.nc**

Standard deviation of thermosteric SSH (m) from 0025-B90. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_sossheig\_standard\_deviation.nc**  
Standard deviation of SSH (m) from 0025-W90. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_standard\_deviation.nc**  
Standard deviation of halosteric SSH (m) from 0025-W90. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_standard\_deviation.nc**  
Standard deviation of steric SSH (m) from 0025-W90. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_standard\_deviation.nc**  
Standard deviation of thermosteric SSH (m) from 0025-W90. Data is filtered with a 12-month boxcar window.

#### FIGURE03

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_ORCA025.L46.LIM2vp.JRA.XIOS2.RAF-KPW001\_1m\_19580101\_20161231\_grid\_T\_ratio\_standard\_deviations\_hc\_ryf90.nc**  
Ratio of SSH variance between 0025-RYF90 and 0025-HC. Data is filtered with a 12-month boxcar window.

#### FIGURE04

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_sossheig\_std\_change.nc**  
Difference in interannual standard deviation for SSH (m) between 0025-HC and 0025-W90

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_std\_change.nc**  
Difference in interannual standard deviation for halosteric SSH (m) between 0025-HC and 0025-W90

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_std\_change.nc**  
Difference in interannual standard deviation for halosteric SSH (m) between 0025-HC and 0025-W90

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_std\_change.nc**  
Difference in interannual standard deviation for thermosteric SSH (m) between 0025-HC and 0025-W90

#### FIGURE05

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_a.nc**  
Steric SSH anomalies (m) from 0025-HC averaged over the domain 10°S-5°S, 165°E-180°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_b.nc**  
Steric SSH anomalies (m) from 0025-HC averaged over the domain 5°S-5°N, 230°E-280°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_a.nc**  
Steric SSH anomalies (m) from 0025-W90 averaged over the domain 10°S-5°S, 165°E-180°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_b.nc**  
Steric SSH anomalies (m) from 0025-B90 averaged over the domain 5°S-5°N, 230°E-280°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_a.nc**  
Steric SSH anomalies (m) from 0025-B90 averaged over the domain 10°S-5°S, 165°E-180°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_b.nc**  
Steric SSH anomalies (m) from 0025-B90 averaged over the domain 5°S-5°N, 230°E-280°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.JRA.XIOS2.RAF-KPW001\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_a.nc**  
Steric SSH anomalies (m) from 0025-B90 averaged over the domain 10°S-5°S, 165°E-180°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.JRA.XIOS2.RAF-KPW001\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_b.nc**  
Steric SSH anomalies (m) from 0025-B90 averaged over the domain 5°S-5°N, 230°E-280°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_nino34.nc**  
Nino34 index based on 0025-HC.

#### FIGURE06

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_a.nc**  
Halosteric SSH anomalies (m) from 0025-B90 averaged over the domain 10°S-5°S, 165°E-180°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_b.nc**  
Halosteric SSH anomalies (m) from 0025-B90 averaged over the domain 5°S-5°N, 230°E-280°E. Linear trend removed.

Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_a.nc**  
Steric SSH anomalies (m) from 0025-B90 averaged over the domain 10°S-5°S, 165°E-180°E. Linear trend removed.  
Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_b.nc**  
Steric SSH anomalies (m) from 0025-B90 averaged over the domain 5°S-5°N, 230°E-280°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_a.nc**  
Thermosteric SSH anomalies (m) from 0025-B90 averaged over the domain 10°S-5°S, 165°E-180°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_b.nc**  
Thermosteric SSH anomalies (m) from 0025-B90 averaged over the domain 5°S-5°N, 230°E-280°E. Linear trend removed. Data is filtered with a 12-month boxcar window.

#### FIGURE07

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_10S.nc**  
Halosteric SSH anomalies (m) from 0025-HC at 10°S. Linear trend and annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_10S.nc**  
Steric SSH anomalies (m) from 0025-HC at 10°S. Linear trend and annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_10S.nc**  
Thermosteric SSH anomalies (m) from 0025-HC at 10°S. Linear trend and annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_10S.nc**  
Halosteric SSH anomalies (m) from 0025-B90 at 10°S. Linear trend and annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_10S.nc**  
Steric SSH anomalies (m) from 0025-B90 at 10°S. Linear trend and annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_10S.nc**  
Thermosteric SSH anomalies (m) from 0025-B90 at 10°S. Linear trend and annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_10S.nc**  
Halosteric SSH anomalies (m) from 0025-W90 at 10°S. Linear trend and annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_10S.nc**  
Steric SSH anomalies (m) from 0025-W90 at 10°S. Linear trend and annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K005.wind90\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_10S.nc**  
Thermosteric SSH anomalies (m) from 0025-W90 at 10°S. Linear trend and annual cycle removed.

#### FIGURE08 and FIGUREA01

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_10S.nc**  
Steric SSH anomalies (m) from 0025-HC at 10°S. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_sohefldo\_10S.nc**  
Ocean-atmosphere heatflux anomalies ( $\text{Wm}^{-2}$ ) from 0025-B90 at 10°S. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_10S.nc**  
Halosteric SSH anomalies (m) from 0025-B90 at 10°S. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_10S.nc**  
Steric SSH anomalies (m) from 0025-B90 at 10°S. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_10S.nc**  
Thermosteric SSH anomalies (m) from 0025-B90 at 10°S. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_tprecip\_10S.nc**  
Precipitation anomalies ( $\text{kgm}^{-2}\text{s}^{-1}$ ) from 0025-B90 at 10°S. Annual cycle removed.

#### FIGURE09 FIGUREA02

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K003.hindcast\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_equator.nc**  
Steric SSH anomalies (m) from 0025-HC at the equator. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_sohefldo\_equator.nc**  
Ocean-atmosphere heatflux anomalies ( $\text{Wm}^{-2}$ ) from 0025-B90 at the equator. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_halosteric\_equator.nc**  
Halosteric SSH anomalies (m) from 0025-B90 at the equator. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_steric\_equator.nc**  
Steric SSH anomalies (m) from 0025-B90 at the equator. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_ssh\_thermosteric\_equator.nc**  
Thermosteric SSH anomalies (m) from 0025-B90 at the equator. Annual cycle removed.

**ORCA025.L46.LIM2vp.CFCSF6.JRA.XIOS2-K004.thermhal90\_1m\_19580101\_20161231\_grid\_T\_tprecip\_equator.nc**  
Precipitation anomalies ( $\text{kgm}^{-2}\text{s}^{-1}$ ) from 0025-B90 at the equator. Annual cycle removed.