

Data Repository for:  
**Decadal variability of Eddy Kinetic Energy in the South Pacific Subtropical Countercurrent in an Ocean General Circulation model**  
Jan K. Rieck, Claus W. Böning, and Richard J. Greatbatch

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:

Rieck, J. K., C. W. Böning, and R. J. Greatbatch, 2018, J. Phys. Oceanogr., Decadal variability of Eddy Kinetic Energy in the South Pacific Subtropical Countercurrent in an Ocean General Circulation model, 48, 757-771, doi:10.1175/JPO-D-17-0173.1 .

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Data needed to reproduce the figures in the study can be found in this repository. All files are in netCDF4\_CLASSIC format. For each figure, there is a directory, that contains all data needed to plot it, along with the figure as it appears in the paper. Note that we do not include data that we did not produce in this repository.

The EKE from satellite altimetry was calculated based on geostrophic velocities produced by SSALTO/DUACS and distributed by Archiving, Validation, and Interpretation of Satellite Oceanographic data (AVISO, <http://www.aviso.altimetry.fr/duacs>).

The observational temperature and salinity from WOA13.v2 can be obtained here: <https://data.nodc.noaa.gov/woa/WOA13>

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

**REF = ORCA025.L46-KJR36292h**  
**CLIM = ORCA025.L46-KLP36227**  
**WIND = ORCA025.L46-KJR36221h**  
**BUOY = ORCA025.L46-KJR36222h**  
**IPOsim = ORCA025.L46-KJR36223h**  
**TROPAC01 = TROPAC01-TRC001**

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A detailed list of files together with a description of the contents can be found below:

#### **FIGURE01/**

##### ***stdEKE\_REF\_93m\_lowpass.nc***

standard deviation of lowpass-filtered EKE from REF at 93m depth divided by the mean EKE (both for 1963-2006), global

##### ***stdEKE\_TROPAC\_93m\_lowpass.nc***

standard deviation of lowpass-filtered EKE from TROPAC01 at 93m depth divided by the mean EKE (both for 1963-2004), 73E-63W, 49S-31N

##### ***ratioEKE\_REFCLIM\_93m\_lowpass.nc***

ratio of variance of lowpass-filtered intrinsic EKE from CLIM to variance of lowpass-filtered total EKE from REF, both at 93m depth for 1963-2006, global

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#### **FIGURE02/**

##### ***stdEKE\_REF\_93m\_lowpass.nc***

standard deviation of lowpass-filtered EKE from REF at 93m depth divided by the mean

EKE (both for 1963-2006), global

***ratioEKE\_REFCLIM\_93m\_lowpass.nc***

ratio of variance of lowpass-filtered intrinsic EKE from CLIM to variance of lowpass-filtered total EKE from REF, both at 93m depth for 1963-2006, global

***stdEKE\_REF\_93m\_zonalmean.nc***

zonal average of the standard deviation of lowpass-filtered EKE from REF at 93m depth divided by the mean EKE (both for 1963-2006), 153-175W, 12-55S

***ratioEKE\_REFCLIM\_93m\_zonalmean.nc***

zonal average of the ratio of variance of lowpass-filtered intrinsic EKE from CLIM to variance of lowpass-filtered total EKE from REF, both at 93m depth for 1963-2006, 153-175W, 12-55S

***EKE\_REF\_93m\_mean\_SouthPacific.nc***

mean (1960-2009) EKE from REF at 93m, South Pacific, 12-55S

***u\_REF\_93m\_mean\_SouthPacific.nc***

mean (1960-2009) zonal velocity from REF at 93m, South Pacific, 12-55S

***EKE\_REF\_93m\_zonalmean.nc***

zonal average of the mean (1960-2009) EKE from REF at 93m, 153-175W, 12-55S

***u\_REF\_93m\_zonalmean.nc***

zonal average of the mean (1960-2009) zonal velocity from REF at 93m, 153-175W, 12-55S

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***FIGURE03/***

***EKE\_REF\_93m\_zonalmean.nc***

zonal average of the mean (1960-2009) EKE from REF at 93m, 153-175W, 12-55S

***sig0\_REF\_0-855m\_zonalmean.nc***

zonal average of the mean (1960-2009) potential density  $\sigma_\theta$  from REF on 17 levels between 0 and 855m, 153-175W, 12-55S

***u\_REF\_0-855m\_zonalmean.nc***

zonal average of the mean (1960-2009) zonal velocity  $u$  from REF on 17 levels between 0 and 855m, 153-175W, 12-55S

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***FIGURE04/***

***EKE\_REF\_surf\_clim.nc***

horizontal average of monthly climatological (1960-2009) surface EKE from REF, 153-175W, 25-33S

***SHEAR\_U\_REF\_clim.nc***

horizontal average of monthly climatological (1960-2009) zonal velocity difference between 93 and 628m from REF, 153-175W, 25-33S

***STRATI\_REF\_clim.nc***

horizontal average of monthly climatological (1960-2009) potential density  $\sigma_\theta$  difference between 93 and 628m from REF, 153-175W, 25-33S

***wT\_REF\_clim.nc***

horizontal average of monthly climatological (1960-2009) baroclinic production  $\overline{w'T'}$  averaged from 64 and 322m from REF, 153-175W, 25-33S

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***FIGURE05/***

**EKE\_CLIM\_93m\_lowpass.nc**

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) EKE at 93m depth from CLIM (year 15-59), 153-175W, 25-33S

**EKE\_REF\_93m\_lowpass.nc**

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) EKE at 93m depth from REF (1963-2006), 153-175W, 25-33S

**EKE\_TROPAC\_93m\_lowpass.nc**

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) EKE at 93m depth from TROPAC01 (1963-2006), 153-175W, 25-33S

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**FIGURE06/**

**dsigdy\_REF\_0-855m\_zonalmean\_anom.nc**

zonal average of the anomalous (1971-1981) meridional gradient of potential density  $\sigma_\theta$  from REF on 17 levels between 0 and 855m, 153-175W, 12-55S, reference period 1960-2009

**EKE\_REF\_93m\_zonalmean\_anom.nc**

zonal average of the anomalous (1971-1981) EKE from REF at 93m depth, 153-175W, 12-55S, reference period 1960-2009

**sig0\_REF\_0-855m\_zonalmean\_anom.nc**

zonal average of the anomalous (1971-1981) potential density  $\sigma_\theta$  from REF on 17 levels between 0 and 855m, 153-175W, 12-55S, reference period 1960-2009

**T\_REF\_0-855m\_zonalmean\_anom.nc**

zonal average of the anomalous (1971-1981) potential temperature from REF on 17 levels between 0 and 855m, 153-175W, 12-55S, reference period 1960-2009

**u\_REF\_0-855m\_zonalmean\_anom.nc**

zonal average of the anomalous (1971-1981) zonal velocity u from REF on 17 levels between 0 and 855m, 153-175W, 12-55S, reference period 1960-2009

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**FIGURE07/**

**sig0both\_REF\_0-855m\_zonalmean\_anom.nc**

zonal average of the anomalous (1971-1981) potential density  $\sigma_\theta$  from REF on 17 levels between 0 and 855m, 153-175W, 12-55S, reference period 1960-2009

**sig0sali\_REF\_0-855m\_zonalmean\_anom.nc**

zonal average of the anomalous (1971-1981) potential density  $\sigma_\theta$  related to anomalies in salinity from REF on 17 levels between 0 and 855m, 153-175W, 12-55S, reference period 1960-2009

**sig0temp\_REF\_0-855m\_zonalmean\_anom.nc**

zonal average of the anomalous (1971-1981) potential density  $\sigma_\theta$  related to anomalies in temperature from REF on 17 levels between 0 and 855m, 153-175W, 12-55S, reference period 1960-2009

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**FIGURE08/**

**EKE\_REF\_93m\_lowpass.nc**

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) EKE at 93m depth from REF (1963-2006), 153-175W, 25-33S

**SHEAR\_U\_REF\_lowpass.nc**

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) zonal velocity difference between 93 and 628m depth from REF (1963-2006), 153-175W, 25-33S

***wT\_REF\_lowpass.nc***

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter)  
baroclinic production  $\overline{w'T'T'}$  averaged from 64 and 322m from REF (1963-2006), 153-175W,  
25-33S

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***FIGURE09/***

***EKE\_BUOY\_93m\_lowpass.nc***

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) EKE  
at 93m depth from BUOY (1963-2006), 153-175W, 25-33S

***EKE\_CLIM\_93m\_lowpass.nc***

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) EKE  
at 93m depth from CLIM (year 15-59), 153-175W, 25-33S

***EKE\_IP0sim\_93m\_lowpass.nc***

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) EKE  
at 93m depth from IP0sim (year 4-25), 153-175W, 25-33S

***EKE\_REF\_93m\_lowpass.nc***

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) EKE  
at 93m depth from REF (1963-2006), 153-175W, 25-33S

***EKE\_WIND\_93m\_lowpass.nc***

horizontal average of yearly, low-pass filtered (5y cutoff period Lanczos filter) EKE  
at 93m depth from WIND (1963-2006), 153-175W, 25-33S

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***FIGURE10/***

***sig0\_WIND\_322m\_zonalmean\_anom.nc***

zonal mean anomalous, low-pass filtered (5y cutoff period Lanczos filter) potential  
density  $\sigma_\theta$  at 322m depth from WIND, 153-175W, 20-45S, reference period 1963-2006

***windstresscurl\_WIND\_zonalmean\_anom.nc***

zonal mean anomalous, low-pass filtered (5y cutoff period Lanczos filter) wind stress  
curl from WIND, 153-175W, 20-45S, reference period 1963-2006

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***FIGURE11/***

***sig0\_WIND\_322m\_meridionalmean\_anom.nc***

meridional mean anomalous, band-pass filtered (2-5y cutoff periods Lanczos filter)  
potential density  $\sigma_\theta$  at 322m depth from WIND, 80-175W, 25-33S, reference period 1961-  
2006

***windstresscurl\_WIND\_anom\_EAST.nc***

horizontal mean anomalous, band-pass filtered (2-5y cutoff periods Lanczos filter) wind  
stress curl from WIND, 110-120W, 25-33S, reference period 1961-2006