

Air-Sea Fluxes: Straw Man Questions

1. How good are data for momentum exchange?
Josey et al., On the Wind Stress Forcing of the Ocean in the SOC Climatology : Comparisons with the NCEP/NCAR, ECMWF, UWM/COADS and Hellerman and Rosenstein Datasets. J. Phys. Oceanog., 32(7), 1993-2019.
2. What governs air-sea momentum exchange?
Yelland, M. J. and P. K. Taylor, 1996: Wind stress measurements from the open ocean, J. Phys. Oceanogr., 26, 541 – 558.
3. What are some examples of momentum exchange?
Samuel, S. L., K. Haines, S. A. Josey and P. G. Myers, 1999 : Response of the Mediterranean Sea thermohaline circulation to observed changes in the winter wind stress field in the period 1980-93,. Journal of Geophysical Research, 104, (C4), 7771-7784.

Dudley B. Chelton, Michael G. Schlax, Michael H. Freilich, and Ralph F. Milliff, Satellite Measurements Reveal Persistent Small-Scale Features in Ocean Winds, Science 13 February 2004; 303: 978-983; published online 15 January 2004 [DOI: 10.1126/science.1091901] plus perspectives by Kathryn Kelly
4. What data are available for air-sea heat fluxes?
Josey, S. A., E. C. Kent and P. K. Taylor, 1999: New insights into the ocean heat budget closure problem from analysis of the SOC air-sea flux climatology Journal of Climate, 12(9), 2856 – 2880.
5. What governs air-sea heat exchange?
Curry, J. A., C. A. Clayson, W. B. Rossow, R. Reeder, Y. C. Zhang, P. J. Webster, G. Liu, and R. S. Sheu, High-resolution satellite-derived dataset of the surface fluxes of heat, freshwater, and momentum for the TOGA COARE IOP, Bull. Amer. Met. Soc., 1999, 80, 2059-2080.

Fairall, C.W., E.F. Bradley, D.P. Rogers, J.B. Edson, G.S. Young, 1996b: Bulk parameterization of air-sea fluxes for TOGA COARE. J. Geophys. Res. 101, 3747-3764.
6. What are examples of air-sea heat exchange?
K.A. Kelly, 2003. The relationship between oceanic heat transport and surface fluxes in the Western North Pacific: 1970-2000, J. Clim., accepted.

Thorpe, R.B., Gregory, J.M., Johns, T.C., Wood, R.A. and Mitchell, J.F.B., 2001: Mechanisms determining the Atlantic thermohaline circulation response to greenhouse gas forcing in a non-flux-adjusted coupled climate model. J. Clim., 14, 3102-3116.

Weller, R. A., M. F. Baumgartner, S. A. Josey, A. S. Fischer and J. Kindle, 1998: Atmospheric forcing in the Arabian Sea during 1994-1995 : observations and comparisons with climatology and models. Deep Sea Research II, 45(11), 1961 - 1999.
7. What governs gas exchange?
Bates, N., and L. Merlivat, The influence of short-term wind variability on air-sea CO₂ exchange, Geophys. Res. Lett, 2001.
8. What do observations show about gas exchange?
Metzl, N. and B. Tilbrook and R. J. Matear, Accumulation and uptake of anthropogenic CO₂ in the Southern Ocean south of Australia between 1968 and 1996, J. Geophys. Res., 1999, 106.
9. What do models show about gas exchange?
Orr, J. C., Maier-Reimer, E., Mikolajewicz, U., Monfray, P., Sarmiento, J. L., Toggweiler, J. R., Taylor, N. K., Palmer, J., Gruber, N., Sabine, C. L., Le Quere, C., Key, R. M. and Boutin, J., 2001: Estimates of anthropogenic carbon uptake from four threedimensional global ocean models. Glob. Biogeochem. Cycle, 15, 43-60.

Ken Caldeira and Philip B. Duffy, The Role of the Southern Ocean in Uptake and Storage of Anthropogenic Carbon Dioxide, Science 28 January 2000; 287: 620-622 [DOI: 10.1126/science.287.5453.620]