



Abstract View

[Volume 15, Issue 10 \(October 1985\)](#)

Journal of Physical Oceanography

Article: pp. 1325–1331 | [Abstract](#) | [PDF \(521K\)](#)

Wind Direction and Equilibrium Mixed Layer Depth: General Theory

Roland W. Garwood Jr. and Patrick C. Gallacher

Naval Postgraduate School, Monterey, CA 93943

Peter Muller

Department of Oceanography, University of Hawaii, Honolulu, HI 96822

(Manuscript received October 29, 1984, in final form May 10, 1985)

DOI: 10.1175/1520-0485(1985)015<1325:WDAEML>2.0.CO;2

ABSTRACT

A usually neglected Coriolis term in the turbulent kinetic energy budget of the ocean surface mixed layer is examined for the special case of a steady-state mixed layer depth with no entrainment. In this term, the Reynolds stresses interact with the northward component of planetary rotation to exchange turbulent kinetic energy between horizontal and vertical components. The direction of the exchange depends upon the sign of east-west component of the wind stress. A vertically integrated or bulk theory is derived for a non-entraining mixed layer in equilibrium. The results show that the vertical turbulent kinetic energy and hence the vertical mixing and mixed layer depth will be reduced for westerly winds. Fasterly winds will increase vertical mixing and mixed layer depth.

Options:

- [Create Reference](#)
- [Email this Article](#)
- [Add to MyArchive](#)
- [Search AMS Glossary](#)

Search CrossRef for:

- [Articles Citing This Article](#)

Search Google Scholar for:

- [Roland W. Garwood](#)
- [Patrick C. Gallacher](#)
- [Peter Muller](#)



DC Office: 1120 G Street, NW, Suite 800 Washington DC, 20005-3826
amsinfo@ametsoc.org Phone: 617-227-2425 Fax: 617-742-8718
[Allen Press, Inc.](#) assists in the online publication of *AMS* journals.