## Abstract View

Volume 12, Issue 6 (June 1982)

**Journal of Physical Oceanography**
Article: pp. 538–555 | Abstract | PDF (1.35M)

# Characteristics of Surface Current Flow Inferred from a Global Ocean Current Data Set

**Gerald A. Meehl**

*National Center for Atmospheric Research, Boulder, CO 80307*

(Manuscript received September 18, 1981, in final form March 5, 1982)

DOI: 10.1175/1520-0485(1982)012<0538:COSCFI>2.0.CO;2

ABSTRACT

A seasonal global ocean-current data set (OCDS) digitized on a 5° grid from long-term mean shipdrift-derived currents from pilot charts is presented and described. Annual zonal means of *v*-component currents show subtropical convergence zones which move closest to the equator during the respective winters in each hemisphere. Net annual *v*-component surface flow at the equator is northward. Zonally averaged *u*-component currents have greatest seasonal variance in the tropics with strongest westward currents in the winter hemisphere. An ensemble of ocean currents measured by buoys and current meters compares favorably with OCDS data in spite of widely varying time and space scales. The OCDS currents and directly measured currents are about twice as large as computed geostrophic currents. An analysis of equatorial Pacific currents suggests that dynamic topography and sea-level changes indicative of the geostrophic flow component cannot be relied on solely to infer absolute strength of surface currents which include a strong Ekman component. Comparison of OCDS *v*-component currents and meridional transports predicted by Ekman theory shows agreement in the sign of transports in the midlatitudes and tropics in both hemispheres. Ekman depths required to scale OCDS *v*-component currents to computed Ekman transports are reasonable at most latitudes with layer depths deepening closer to the equator.