GEOSTROPHIC TRANSPORT CALCULATIONS IN THE CENTRAL PACIFIC BASED ON THE SHIP-OF-OPPORTUNITY XBT LINES

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MEAN SEA SURFACE DYNAMIC TOPOGRAPHY
AT 150° W–170° W
RELATIVE TO 450 m
FEB. 1982 TO MAY 1983

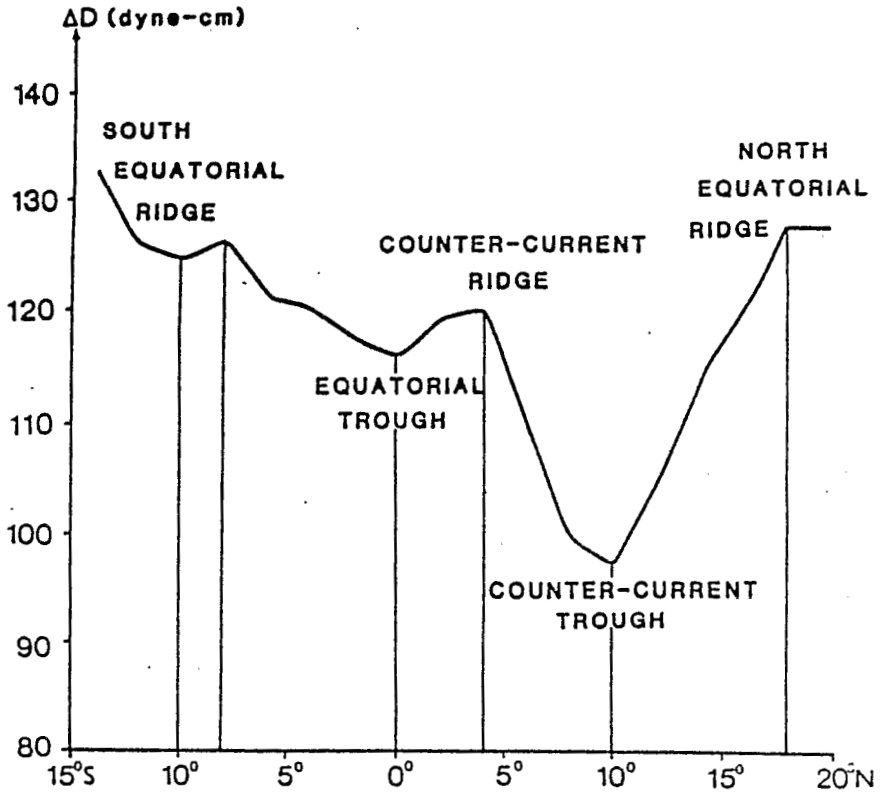

Figure 1

TIME SERIES OF DYNAMIC HEIGHT AT
TROUGHS AND RIDGES SHOWN IN FIG. 1
AT 150°W - 170°W

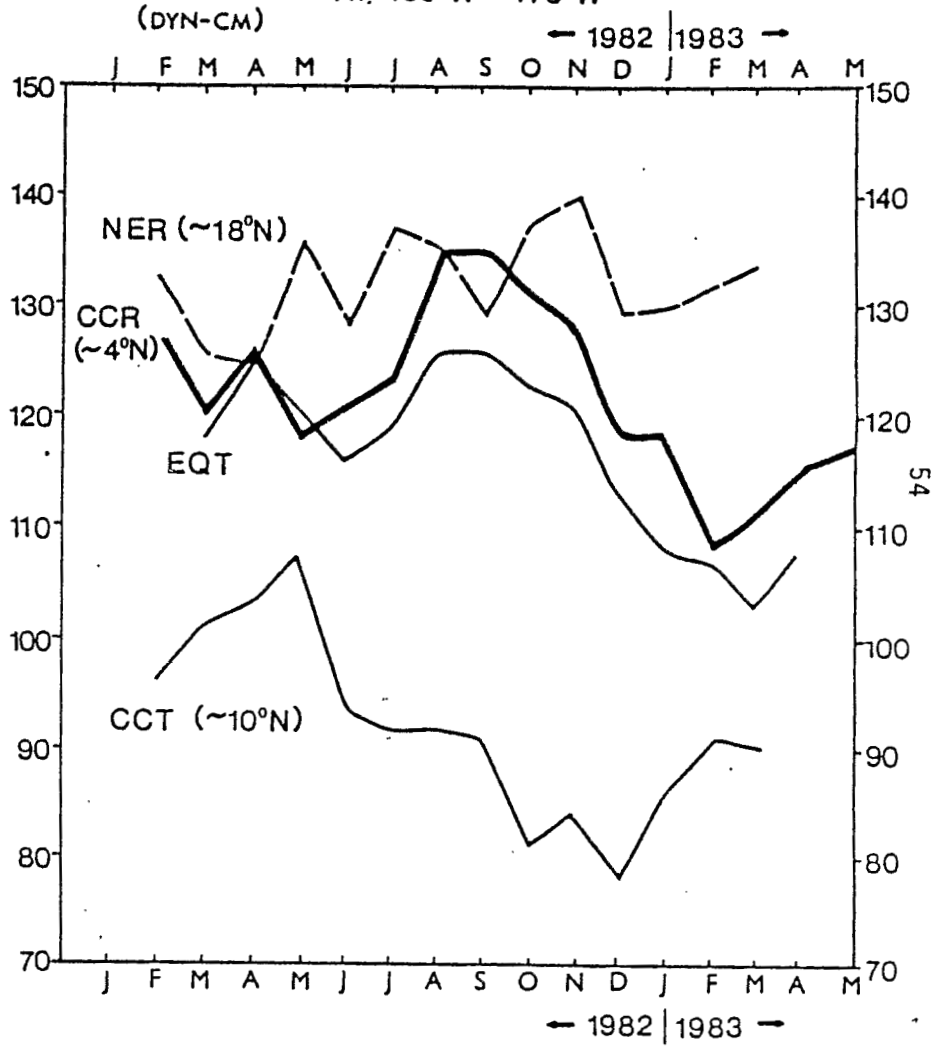

Figure 2

As contrasted with the NER, the other ridges and troughs show strong El Nino related signals. The counter-current trough (CCT) at about 10°N drops

TRANSPORT IN THE
NORTH EQUATORIAL COUNTER-CURRENT

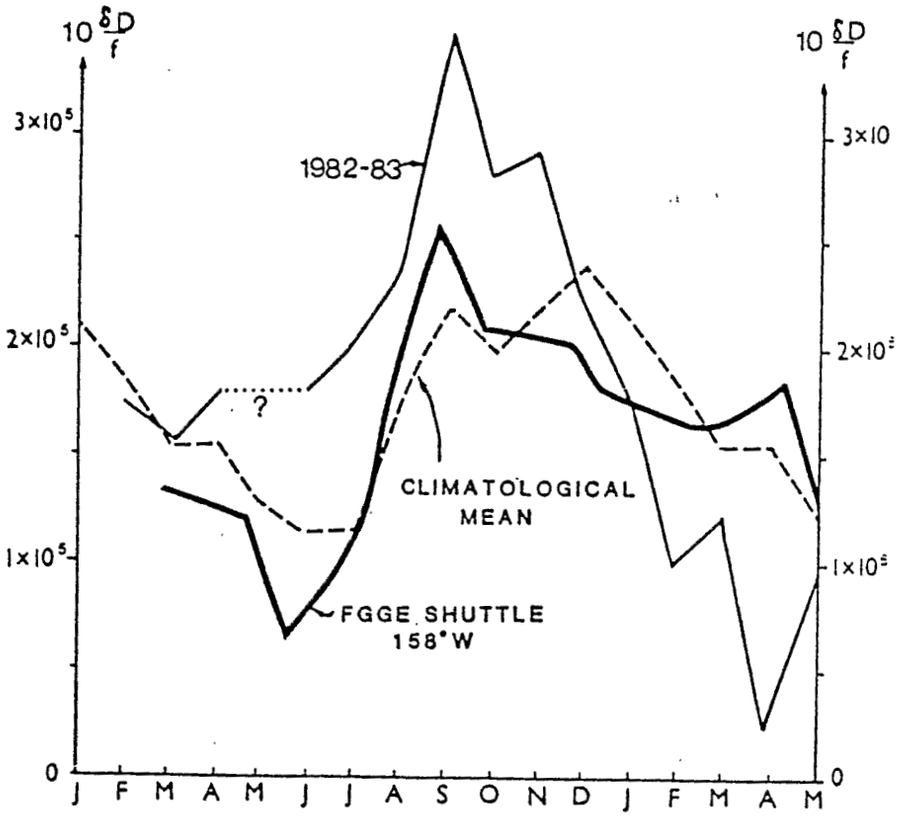

Figure 3 CLIMATOLOGY FROM WYRTKI (1974)

During the Shuttle the NECC transport never got above 33 Sv so that the peak 1982 value of 44 Sv was about 30% higher than during FGGE which was similar in pattern and magnitude to climatology. The 1982-1983 peak seems to be narrower than these other records.

An empirical orthogonal function decomposition of the meridional dynamic height variability shows the large-scale patterns of variation and their time variability (Figure 4). The first EOF represents 54% of the total variance and shows that the field from 6°S to 4°N fluctuates in concert. This EOF accounts for only about 10% of the variance at 10°-12°N in the CCT region, but 80% or more south of 4°N. The time variation of its amplitude shows the positive pulse starting in August and the turn towards negative in November. The second EOF, by contrast, accounts for 31% of the total variance. It shows less than 20% of the variance in the near-equatorial region, but about 80% at 10°-12°N at the CCT. The time variation of this EOF might be interpreted as the annual signal. Also it is similar to that for EOF1 lagged by four months. The rise at the CCT as shown by EOF2 occurs in May-June or before that close to the equator (EOF1) which occurs in July-August.

The last item I will mention is the mixed-layer temperature field observed at 150°-170°W during the Shuttle and in 1982-1983. During the Shuttle, warmer water than 28°C was almost always found a couple of degrees off

EOF 1, 2 OF DYNAMIC HT. (NOUMEA)

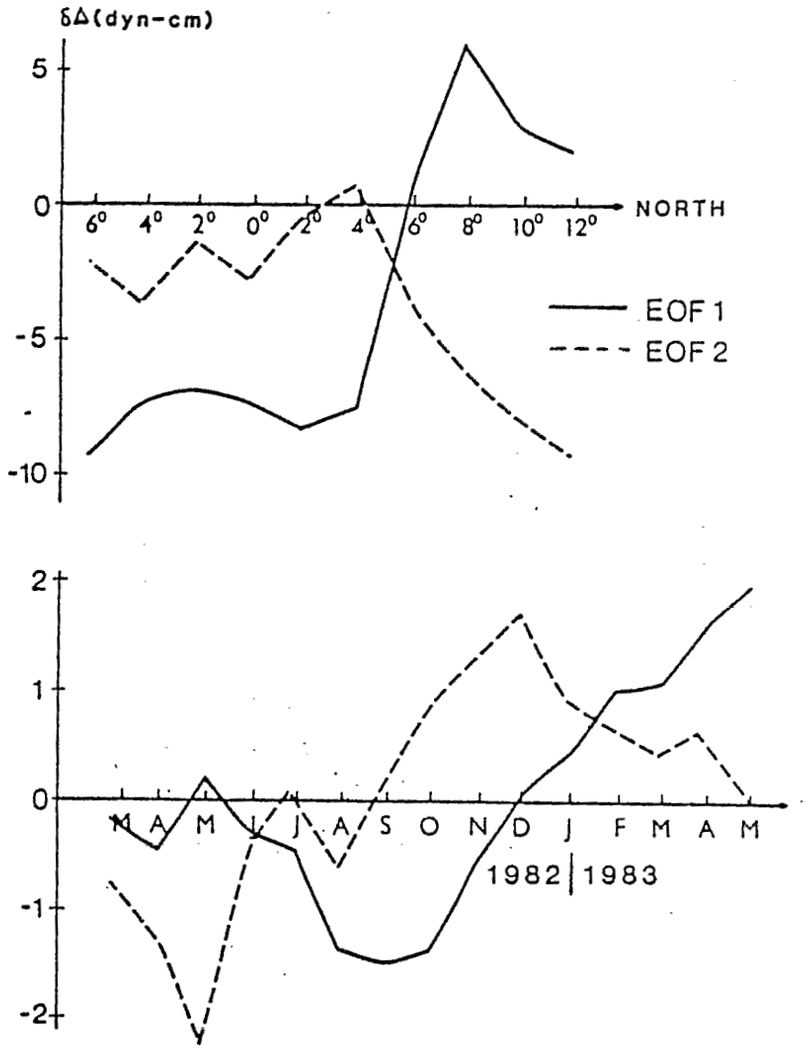

Figure 4

DEPTH OF 28°C ISOTHERM AT 150°-170° W
DURING 1982-83

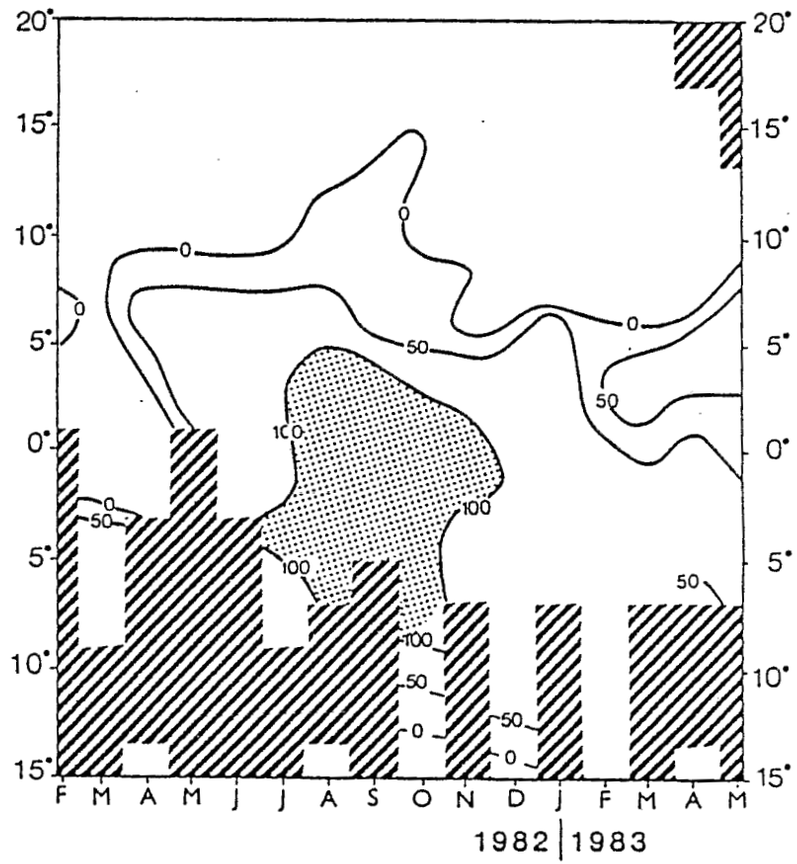

Figure 5

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(ABSTRACT)

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From ship-of-opportunity XBT data in the Central Pacific, dynamic calculations have been made. Dynamic height at troughs and ridges have been considered mainly during the 1982-83 EL-Nino. The North Equatorial Counter Current transport get a peak value in September 1982 (44 Sverdrup). Comparison of the ship of opportunity data is made with the climatological mean and the FGGE shuttle ones.

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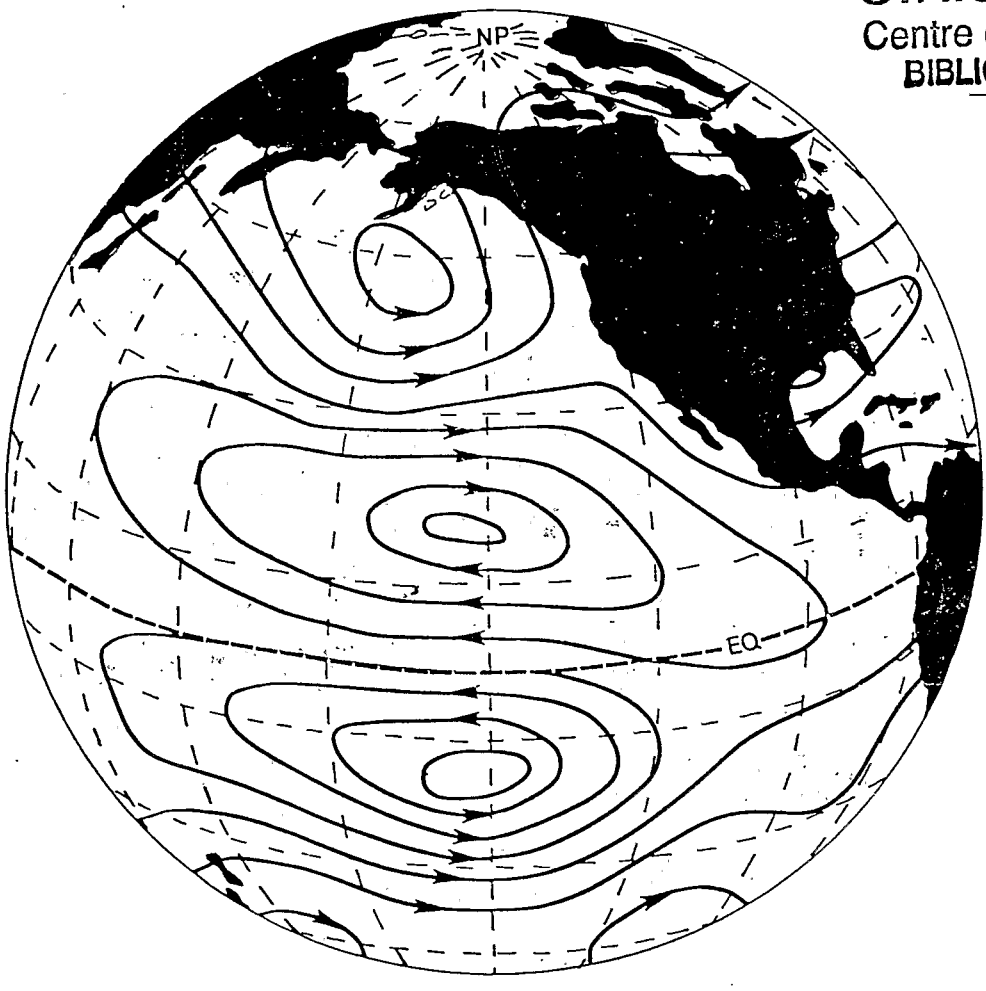
DONGUY

PAPERS FROM

1982/83 EL NIÑO/SOUTHERN OSCILLATION WORKSHOP



HELD AT

NOAA/AOML, MIAMI, FLORIDA

NOVEMBER 3-4, 1983

December, 1983

1982-83 EL NINO/SOUTHERN OSCILLATION DATA DISPLAY WORKSHOP

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