Climatología Dinámica / Simulación del Clima / Climatología Física (2020)

MODULO 3

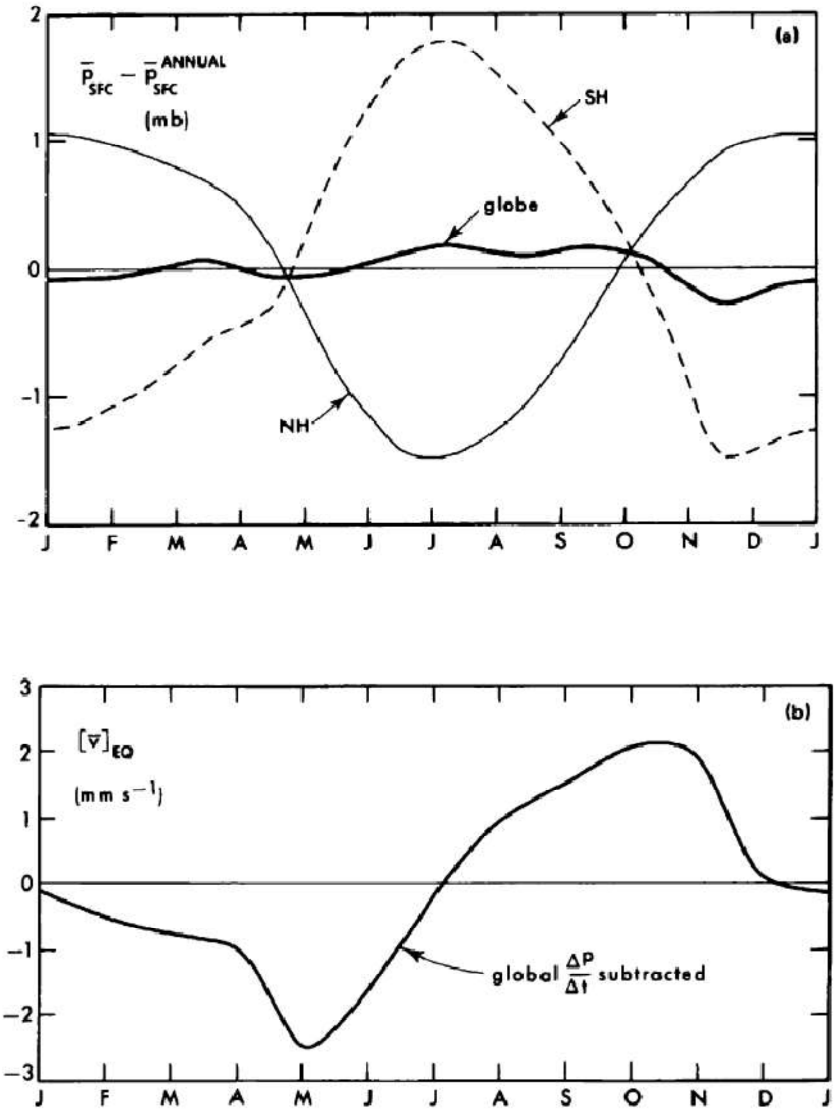

FIGURE 7.3. (a) Annual variation in the average surface pressure (i.e., actual, not reduced to sea level) over the two hemispheres and the globe in mb from Oort (1983). Plotted are departures from the annual-mean values. (b) Annual variation in the vertical-mean meridional velocity (in mm s^{-1}) across the equator as inferred from the hemispheric pressure changes shown in (a). The actual cross-equatorial transports of mass in units of 10^9 kg s^{-1} can be obtained by multiplying the plotted velocity values by 0.4.

(1) Describir el ciclo anual del transporte de masa (atmosférica) a través del ecuador según la fig. 7.3 del libro de Peixoto y Oort.

TABLE • 7.1. Estimated mean annual values of the precipitation rate P, evaporation rate E, runoff rate $(P - E)$, evaporation ratio E/P (an aridity index), and runoff ratio $(P - E)/P$ for 10° latitude belts, the hemispheres, and the globe from Baumgartner and Reichel (1975). For comparison, Sellers' (1965) estimates for P and E, and Peixoto and Oort's (1983) independent estimates of $P - E$ as computed from Table 12.1 are shown in parentheses.

	Surface area	P	E	$P - E$	E/P	$(P - E)/P$
80–90 °N	3.9	46 (120)	36 (42)	10 (93)	0.78	0.22
70–80 °N	11.6	200 (185)	126 (145)	74 (124)	0.63	0.37
60–70 °N	18.9	507 (415)	276 (333)	231 (224)	0.54	0.46
50–60 °N	25.6	843 (789)	447 (469)	396 (250)	0.53	0.47
40–50 °N	31.5	874 (907)	640 (641)	234 (156)	0.73	0.27
30–40 °N	36.4	761 (872)	971 (1002)	− 210 (23)	1.28	− 0.28
20–30 °N	40.2	675 (790)	1110 (1246)	− 435 (− 435)	1.64	− 0.64
10–20 °N	42.8	1117 (1151)	1284 (1389)	− 167 (− 322)	1.15	− 0.15
0–10 °N	44.1	1885 (1934)	1250 (1235)	635 (478)	0.66	0.34
0–10 °S	44.1	1435 (1445)	1371 (1304)	64 (144)	0.96	0.04
10–20 °S	42.8	1109 (1132)	1507 (1541)	− 398 (− 342)	1.36	− 0.36
20–30 °S	40.2	777 (857)	1305 (1416)	− 528 (− 312)	1.68	− 0.68
30–40 °S	36.4	875 (932)	1181 (1256)	− 306 (128)	1.35	− 0.35
40–50 °S	31.5	1128 (1226)	862 (895)	266 (150)	0.76	0.24
50–60 °S	25.6	1003 (1046)	553 (520)	450 (278)	0.55	0.45
60–70 °S	18.9	549 (418)	229 (174)	320 (245)	0.42	0.58
70–80 °S	11.6	230 (82)	54 (45)	176 (98)	0.23	0.77
80–90 °S	3.9	73 (30)	12 (0)	61 (32)	0.16	0.84
0–90 °N	255.0	970 (1009)	897 (944)	73 (39)	0.92	0.07
0–90 °S	255.0	975 (1000)	1048 (1064)	− 73 (− 39)	1.07	− 0.07
Globe	510.0	973 (1004)	973 (1004)		1.00	
Units	10^6 km^2	mm yr^{-1}	mm yr^{-}	mm yr^{-}		

(2) Describir cómo debe ser el intercambio de agua (vapor y líquida) entre hemisferio sur y hemisferio norte de acuerdo a la tabla 7.1 del libro de Peixoto y Oort.

LECTURA OBLIGATORIA:

Frierson et al. (2013) Contribution of ocean overturning circulation to tropical rainfall peak in the Northern Hemisphere. Nature Geoscience DOI: 10.1038/NGEO1987

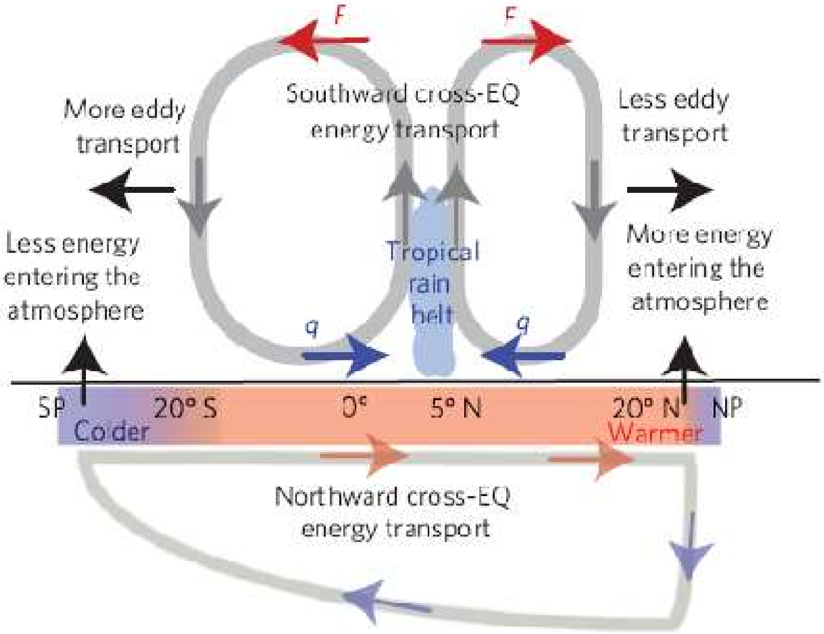

Figure 3 | Schematic of the role of the oceanic MOC in forcing the Northern Hemisphere maximum of tropical precipitation. Heat is released from the ocean to the atmosphere in the Northern Hemisphere owing to cross-equatorial OHT. The atmosphere responds through eddy energy transports in the extratropics, and a cross-equatorial Hadley circulation, which fluxes energy from the Northern Hemisphere to the Southern Hemisphere. The moisture transport by the Hadley circulation is in the opposite direction as the energy transport, so tropical precipitation moves northwards. SP, South Pole; NP, North Pole; cross-EQ, cross-equatorial; *q*, moisture transport; *F*, energy transport.

MOC : meridional overturning circulation

OHT: northward cross-equatorial ocean heat transport

(3) Describir los procesos de la fig. 3 del paper Frierson et al. (2013)