

由於太陽能分布不均所造成的風場

Figure 9.1 Winds driven by uneven solar heating and the Earth's spin power the movement of the ocean's surface currents.

造成海洋環流的力

太陽能

風

地球自轉 (科氏效應)
(Coriolis Effect)

重力

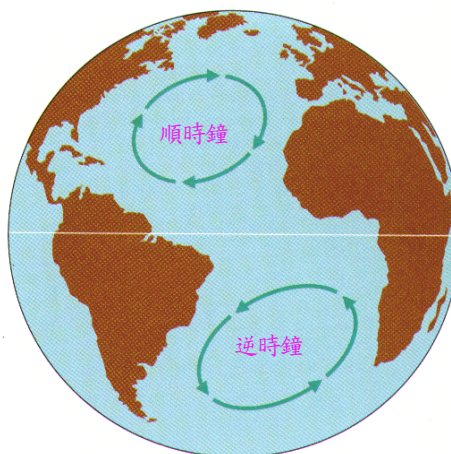


Figure 9.2 A combination of four forces—the sun's heat, winds, the Coriolis effect, and gravity—circulates the ocean surface clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere forming gyres.

北大西洋的環流

灣流

北大西洋海流

Canary 海流

北赤道洋流

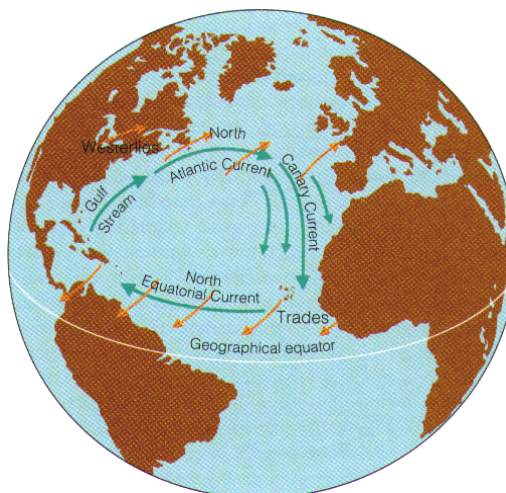


Figure 9.3 The North Atlantic gyre, a series of four interconnecting currents with different flow characteristics and temperatures.

地轉效應

風吹 水流

向右轉 – 北半球

向左轉 – 南半球

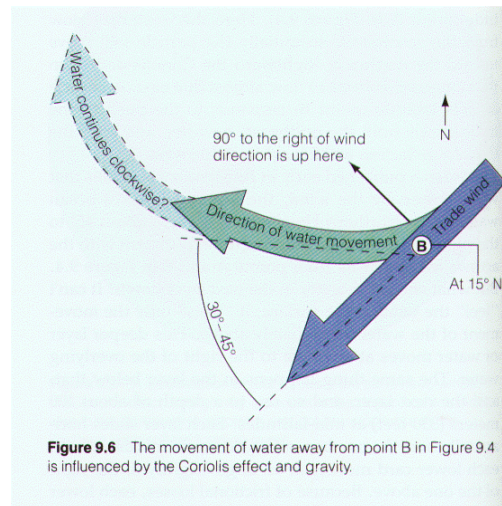


Figure 9.6 The movement of water away from point B in Figure 9.4 is influenced by the Coriolis effect and gravity.

地轉效應

風吹 水流

向右轉 – 北半球

向左轉 – 南半球

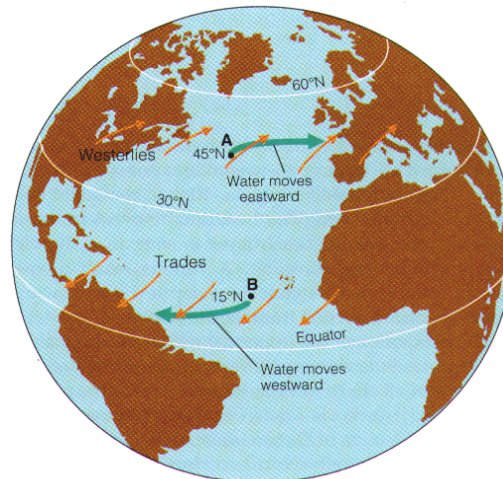
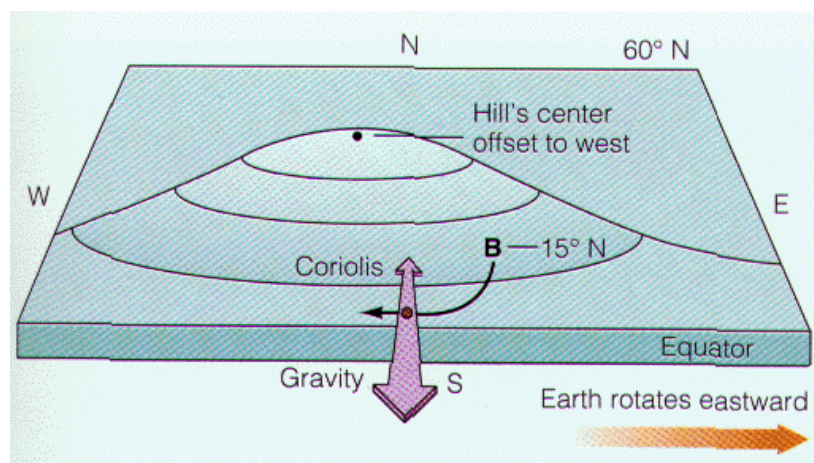


Figure 9.4 Surface water blown by the winds at point A will veer to the right of its initial path, then continue eastward. Water at point B veers right and continues westward.



冬天的蒙古高壓 造成 台灣的東北季風

流量 55 Mt/s
55,000,000噸/秒

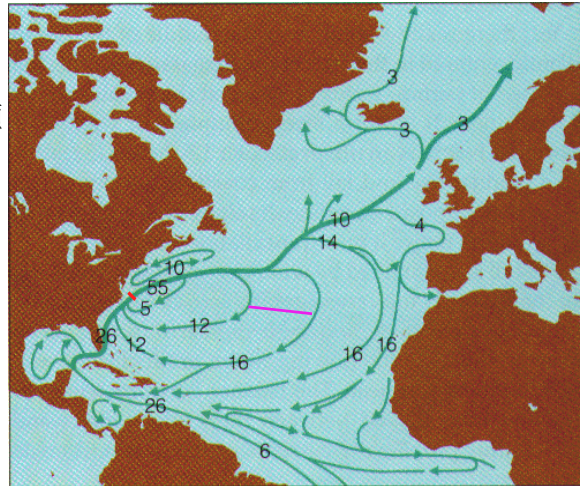
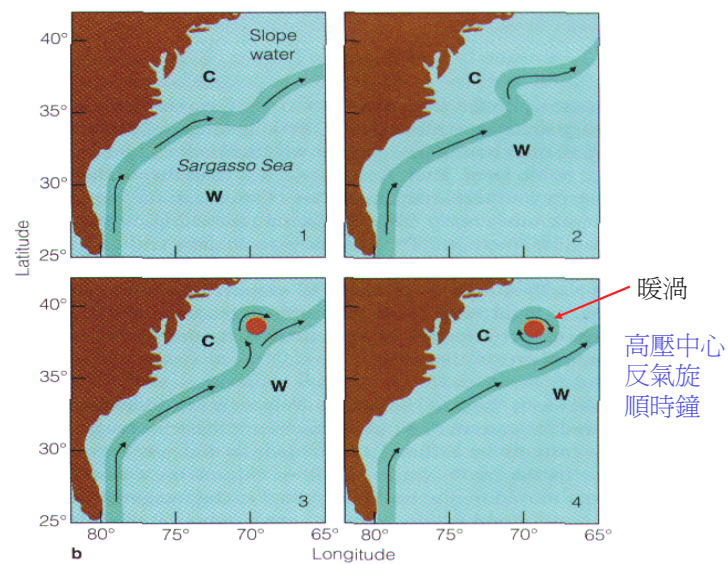
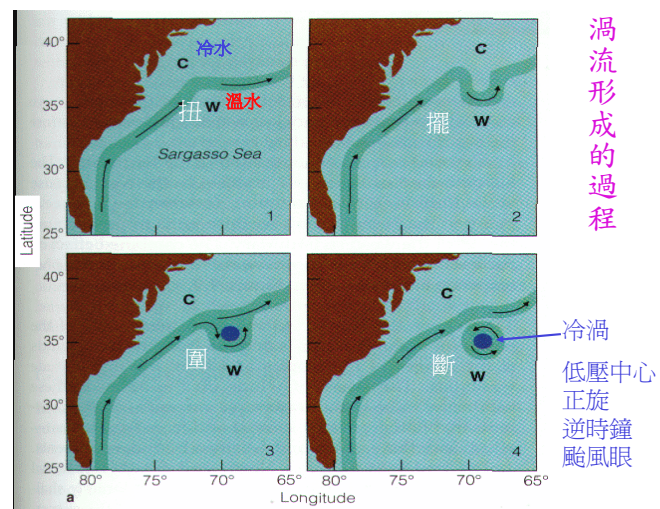
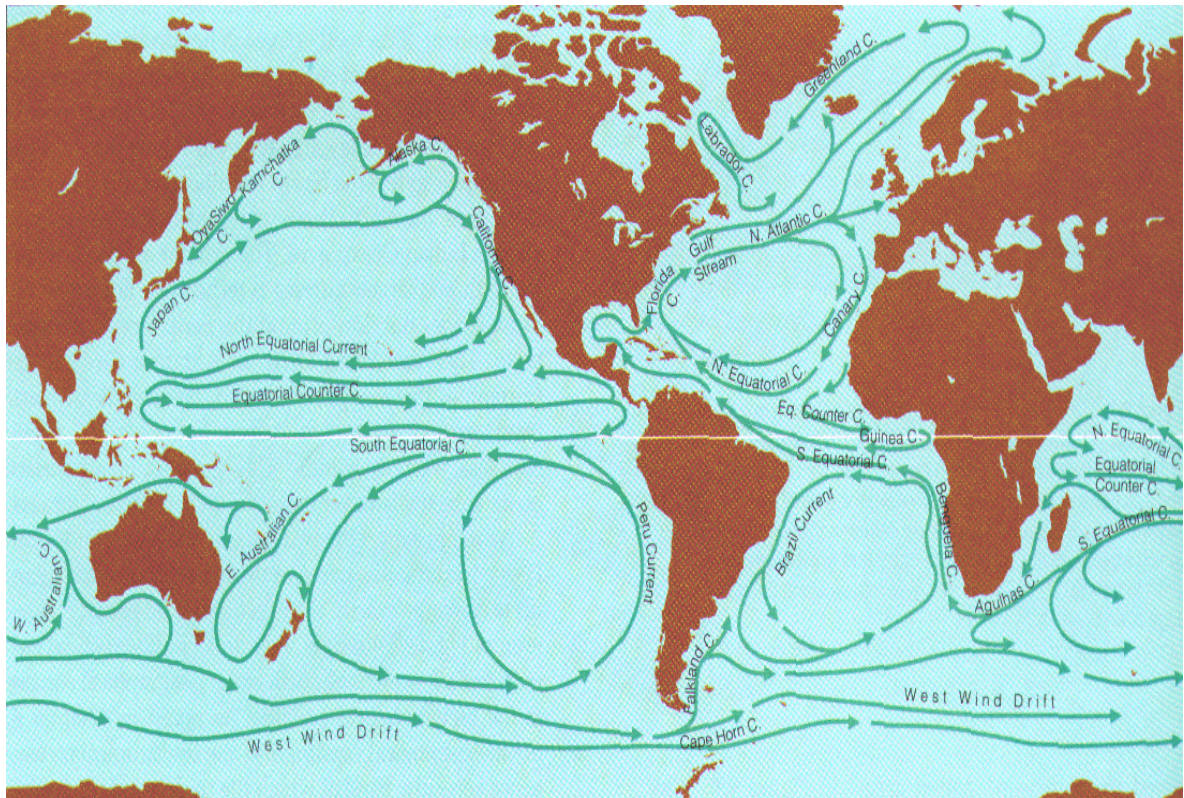


Figure 9.9 The general surface circulation of the North Atlantic. The numbers indicate flow rates in sverdrups (1 sv = 1 million cubic meters of water per second).

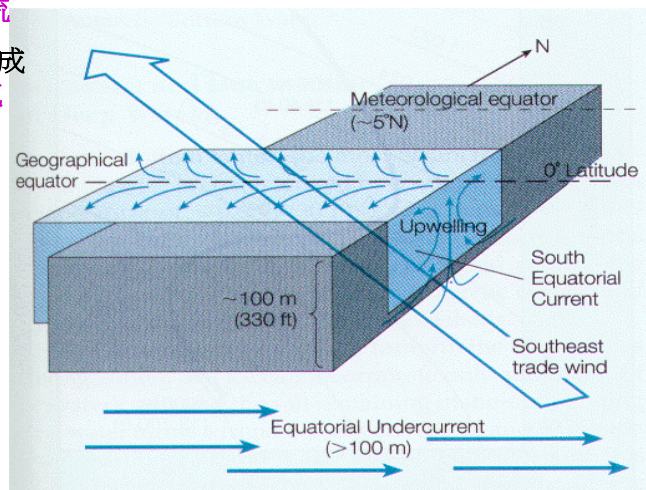


世界各大洋的主要海流

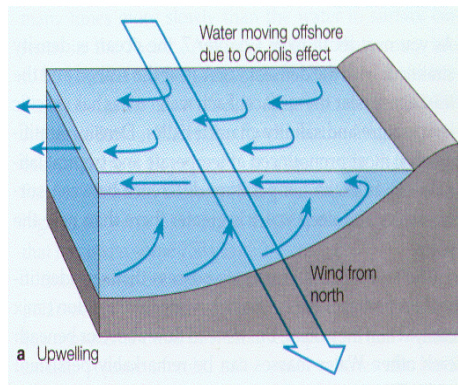


貿易風 將赤道的水

1. 撥離赤道 造成
赤道湧升流
2. 吹向西方 造成
南赤道海流
3. 回流形成
赤道潛流



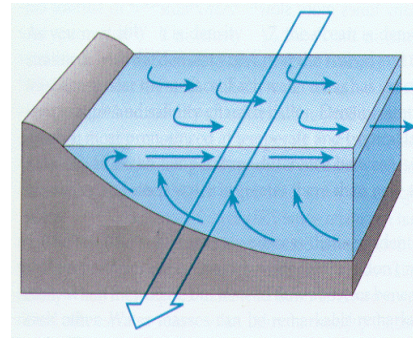
穩定北風 在北美西岸 造成
離岸流, 沿岸流及穩定的湧升流



穩定的沿岸南風與祕魯湧升流
祕魯海流

西南風 & 大陸沿岸的湧升流

北風在南美東岸也可造成
離岸流, 沿岸流及湧升流



湧升流的大小 隨風力的
大小, 方向與久暫而定

1000m水層

東西向垂直斷面

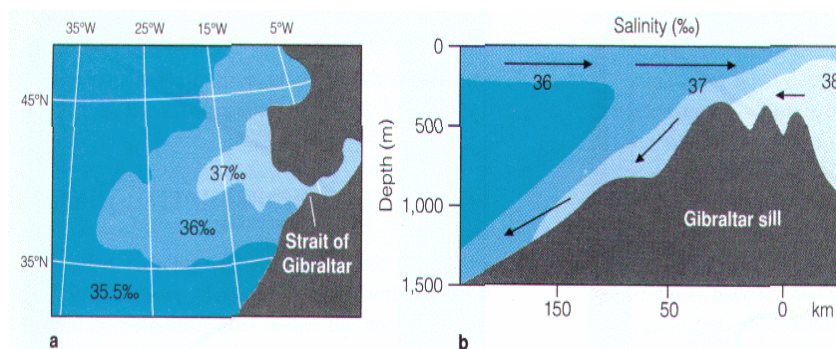
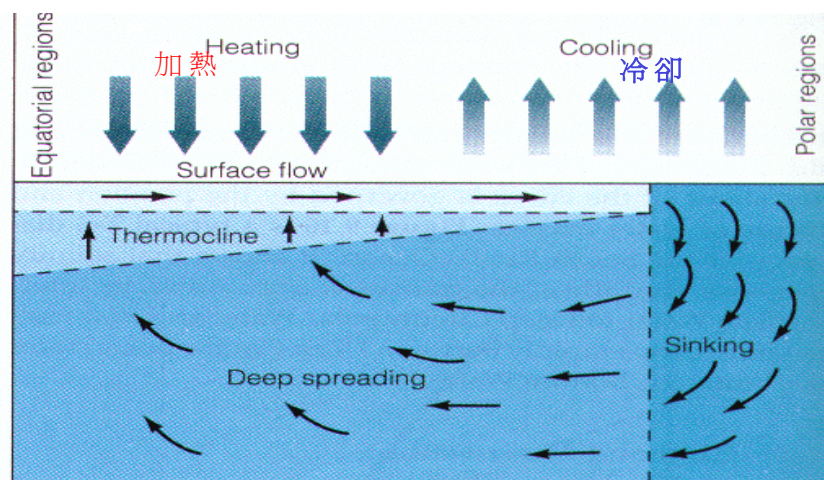


Figure 9.18 Saline flow over the sill of the Mediterranean Sea at Gibraltar. (a) A map showing the Strait of Gibraltar; salinity was measured at 1,000 meters. (b) A vertical section at the strait showing the movement of water masses of different salinity.

溫鹽垂直環流



大西洋的水團 — 表層 中層 深層 底層

