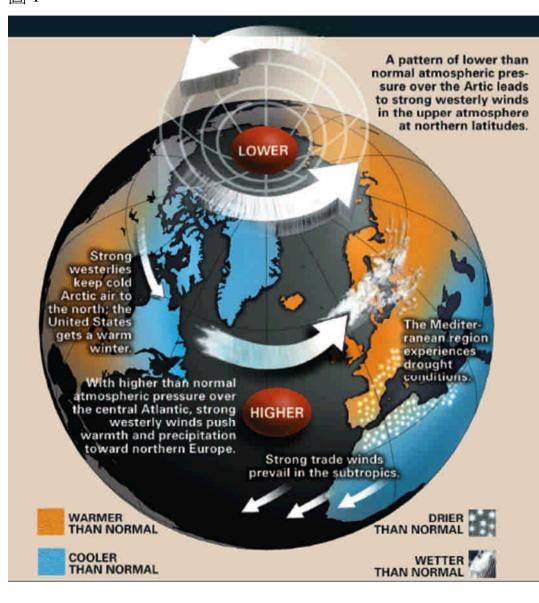
所謂的北極振盪(Arctic Oscillation,簡稱 AO)是指北半球北緯 20 度以北地區,大氣最顯著的現象之一,通常在冬季它的變化幅度會較明顯,氣象上以 AO 指數來說明這個現象。當 AO 指數爲正值時,代表極區的氣壓比較低,而中高緯度的氣壓比較高,此時靠近北極的西風噴流(風速最大的區域)一般也會較強。當西風噴流比較強時(即 AO 指數爲正值),此時天氣系統傾向於東西向移動,極區冷空氣較不容易南下影響中緯度地區的天氣。例如,北美容易出現偏暖的天氣、地中海區域的國家容易出現乾旱、北歐的國家則出現偏暖和降雨的情形(圖 1,註¹)。當 AO 指數爲負值時,代表極區的氣壓比較高,而中緯度的氣壓比較低,西風噴流也會較弱。當西風噴流比較弱時,天氣系統比較容易有南北方向的移動,此時極區冷空氣便更容易南下影響中緯度地區的天氣。例如,北美容易出現偏冷的天氣、地中海區域國家出現降雨偏多、北歐及亞洲地區的國家出現偏冷的天氣(圖 2)。

至於 AO 的成因,目前科學界還沒有明確的答案。它可能是單純的地球大氣內部的自然律動現象,也可能是受海溫變化所影響。目前,氣象界對 AO 的預測能力仍相當有限。您可以連結到以下網址,看看 AO 指數的變化與美國科學家的預測: <a href="http://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily\_ao\_index\_mrf.shtml">http://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily\_ao\_index\_ao\_index\_mrf.shtml</a>

註<sup>1</sup>: 圖 1 和圖 2 摘自於 http://jisao.washington.edu/wallace/natgeo/ArcticSubart.pdf

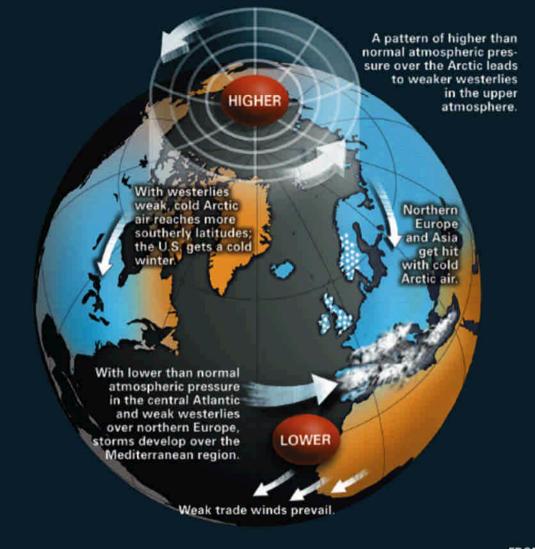


## **WARM PHASE**

The recent warm phase has brought a number of startling changes to the Arctic Ocean. New wind and water currents have drawn relatively warm, salty Atlantic water 20 percent farther into the Arctic than usual (below). Meanwhile, the layer of especially cold water that insulates sea ice from the warmer Atlantic water has thinned across much of the Arctic—and so has the sea ice itself, by an average of four feet.



Cooler Arctic water Warmer Atlantic water MODEL DEPICTS WATER LAYER AT 920-1,180 FEET BELOW SEA LEVEL



## **COOL PHASE**

In cooler periods strong surface winds maintain a powerful clockwise gyre, or circular current, in the western Arctic that keeps Atlantic water at bay. These wind and water currents also distribute the ocean's colder, fresher insulating water layer more evenly, which inhibits the melting of ice. Until the recent warm phase, this was considered the Arctic's "normal" pattern.



Cooler Arctic water Warmer Atlantic water

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