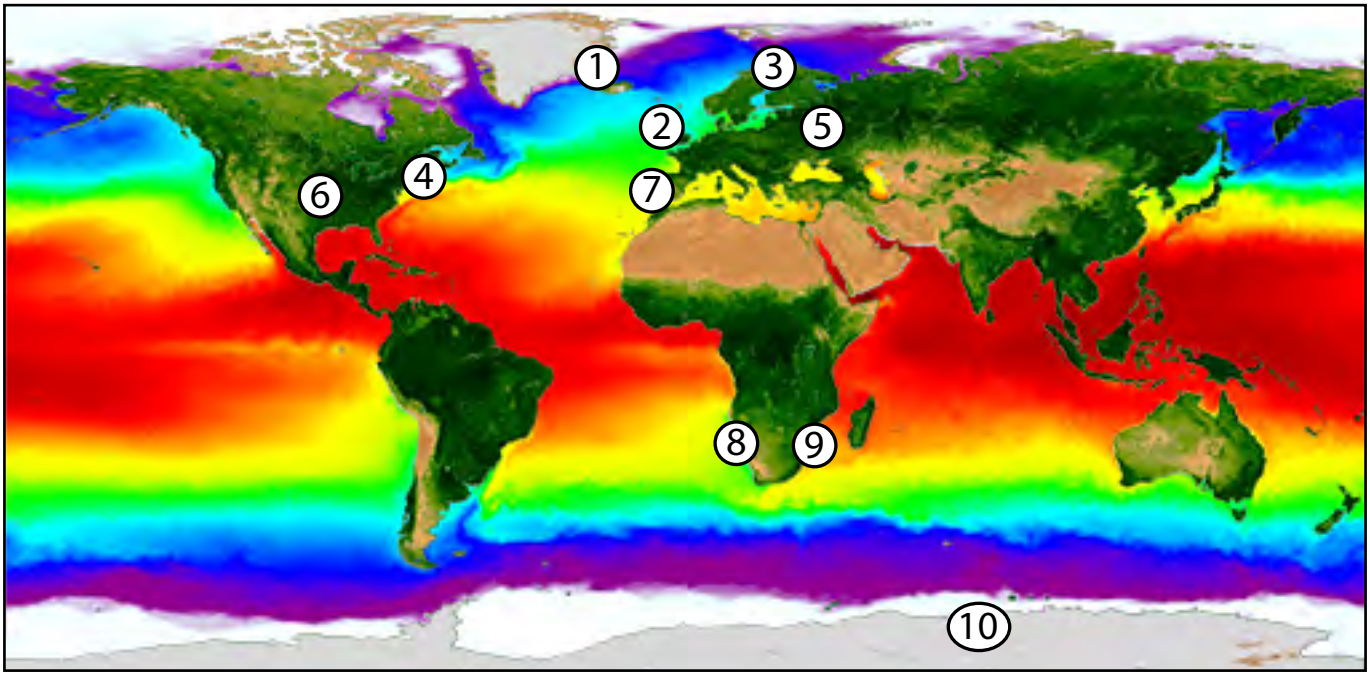
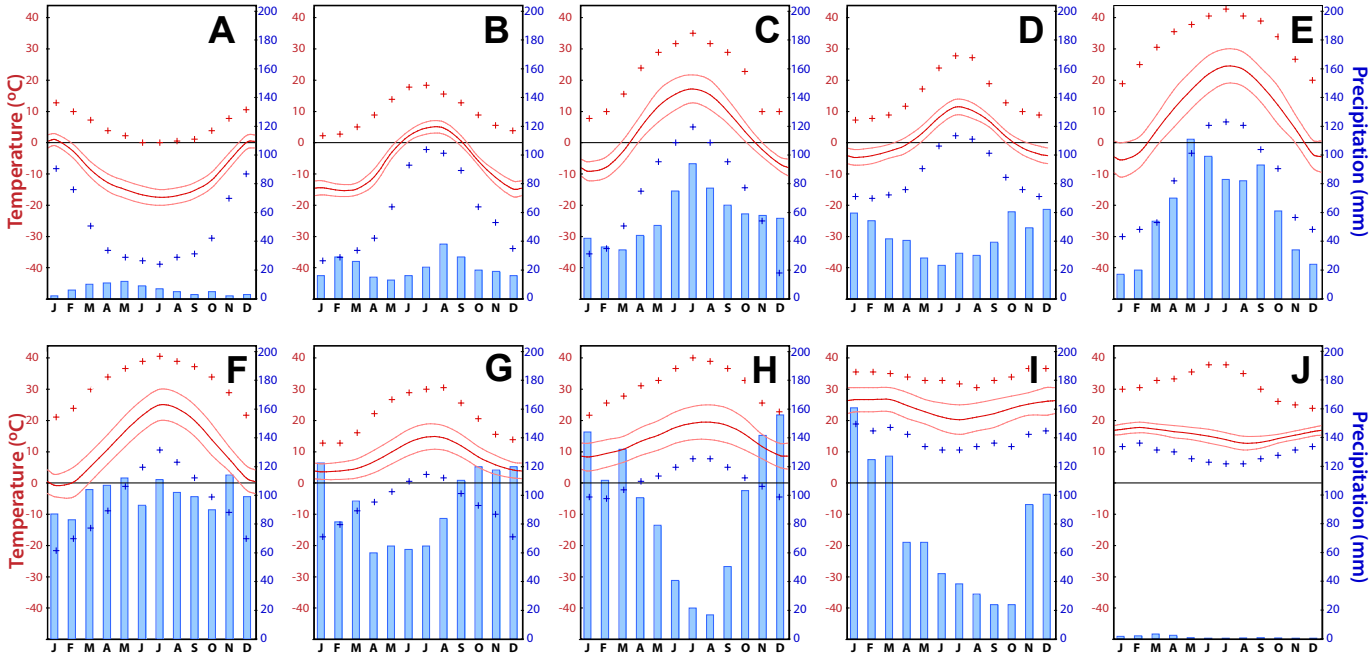
Oceans and Climate Quiz

National Oceanography Centre
NATURAL ENVIRONMENT RESEARCH COUNCIL

Match the plots of average temperature and rainfall to the correct location on the map





WHAT TO DO

The climate around the world is powered by the solar energy that reaches Earth's surface. This varies with latitude and season.

Transport of heat and moisture in the atmosphere and ocean system also influence temperature and rainfall in different regions.

Bear this in mind when you try to match the climate statistics shown in each graph to the corresponding numbered location on the the map above.

On the back of this sheet you can find a few hints that may help you decide the location for each plot.

1. Scoresbysund, Greenland.....
2. Glasgow, Scotland .....
3. Hammerfest, Norway .....
4. New York, USA .....
5. Moscow, Russia .....
6. Omaha, Nebraska .....
7. Porto, Portugal .....
8. Walvis Bay, Namibia .....
9. Inhambane, Mozambique .....
10. Davies, Antarctica .....

Factors controlling temperature

1. **Latitude:** annual energy input from the sun decreases with distance from the equator, so mean annual temperatures also decrease; seasonal differences increase towards the poles.
2. **Winds:** winds that have blown from a warm area will increase the temperature, and winds that have blown from a cool are will decrease it. Prevailing winds are westerly (from the west) at mid latitudes (~40-60^{o} North and South) and easterly (from the east) in the trade wind belts (~5-30^{o} North and South).
3. **Distance from the sea:** land heats and cools faster than the sea, so coastal areas have a lower temperature range than inland areas.
4. **Altitude:** temperatures decrease with height, at about 1°C per 100m.
5. **Aspect:** slopes facing the sun are warmer than those that are not.

Factors controlling the amount of precipitation (rain and snow)

1. **Air humidity:** sea air generally has a higher humidity than air that has blown across ice or dry land. Air that has passed over warm currents contain more water vapour than air from cold currents.
2. **Temperature:** warm air contains more water vapour than cold air of the same humidity. Cooling and warming: when air cools down past its dew point (100% humidity), water vapour condenses into small droplets or ice crystals that can form fog or clouds, rain or snow.

The role of ocean currents

Sea surface temperature has an impact on the climate of nearby land masses. The air above warm water contains more heat and water vapour than the air above cooler water. Land that lies downwind of a warm current will therefore often have warmer winter temperatures and higher rainfall than land near cold currents.