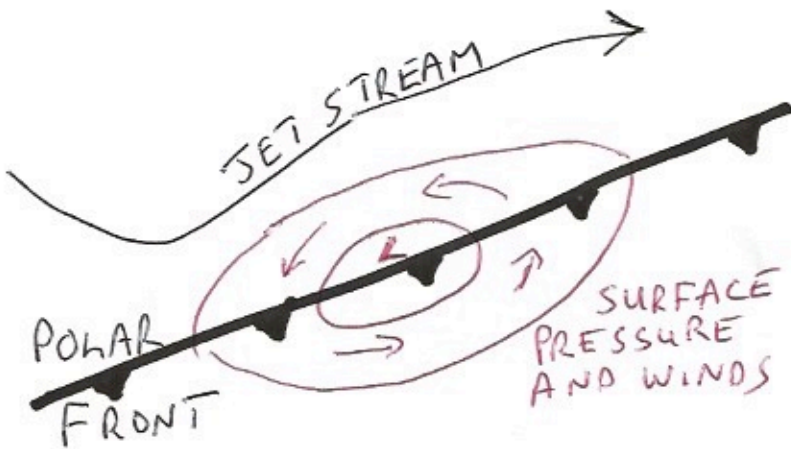
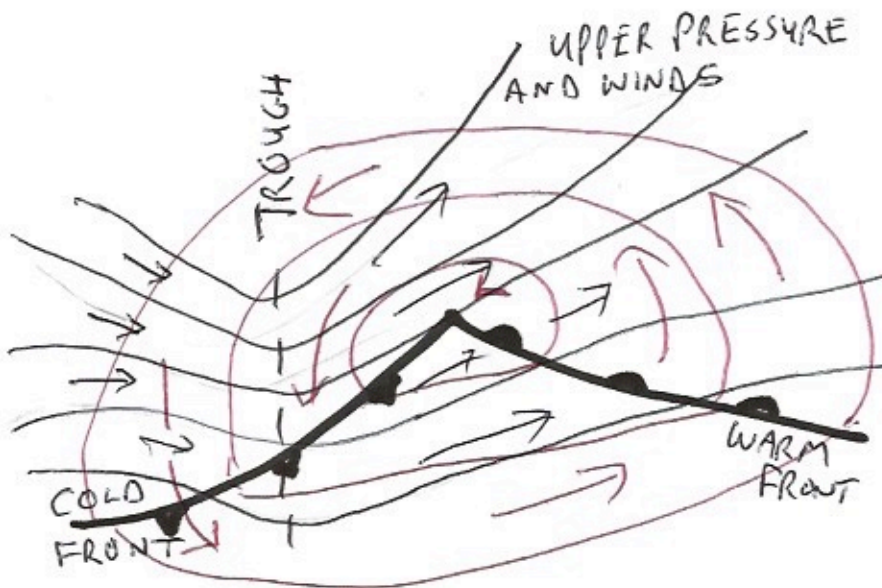


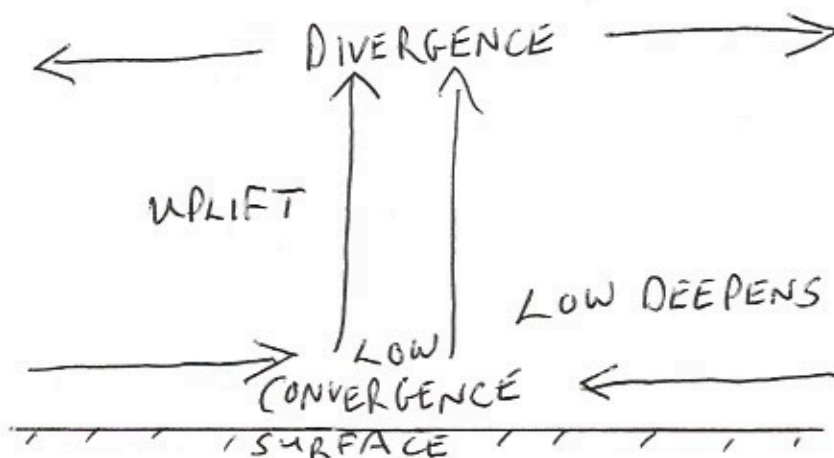
CYCLOGENESIS : THE FORMATION OF FRONTAL DEPRESSIONS



The Polar Front is a semi-permanent feature in the north Atlantic ocean marking the boundary between cold maritime Polar air (mP) and warm maritime Tropical air (mT). At a point along this front pressure starts to fall. This is usually just ahead of a trough in the Rossby long waves that form in the upper atmosphere, associated with a central core of high speed westerly winds called the Jet Stream.



This diagram shows how air diverges aloft in the upper westerlies of the Rossby long waves. This divergence is marked by the upper isobars spreading. This divergence aloft allows the cyclonic convergence of air to occur at low levels while allowing the pressure of the developing depression to deepen. A kink develops in the Polar Front allowing the formation of a warm front, cold front and warm sector. Air is pushed aloft at the fronts to cause cloud and rain.



This cross section shows the relationship between the divergence aloft, the low pressure centre at low level and the way that the low can continue to intensify and deepen. It is only the divergence at higher altitudes that allows the inflow of air at low levels to rise and form cloud, while the low pressure continues to fall. When the divergence aloft reduces the inflow of air at low levels to the centre of the low causes it to fill and dissipate.