GENERAL WINDS

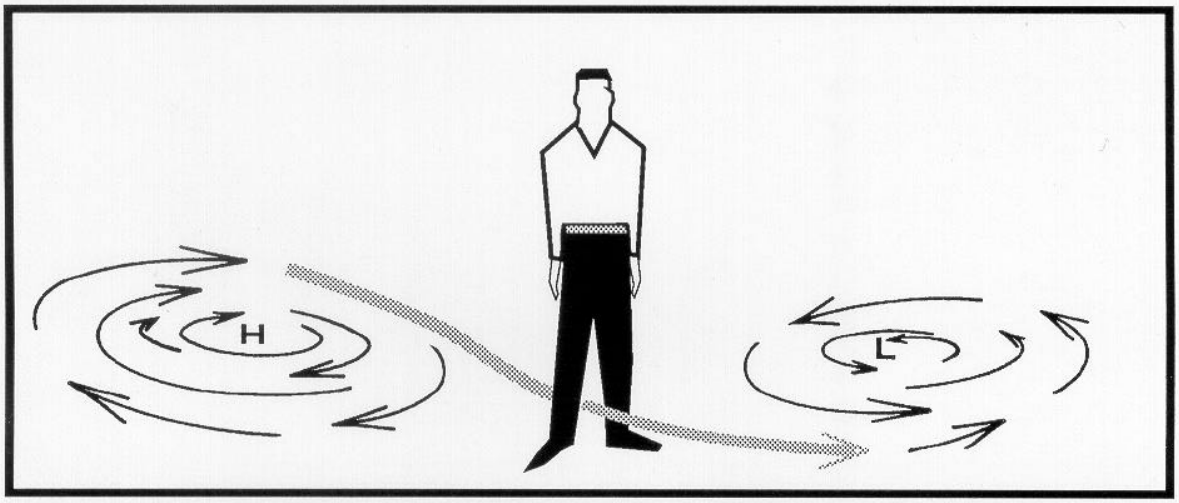

Figure 1. "Back to the wind, high pressure on the right" is a useful rule. Air near the surface flows from high to low pressure areas. Air accumulated near the surface in Low centers is forced aloft; the removal of air from High centers requires downward displacement of air.

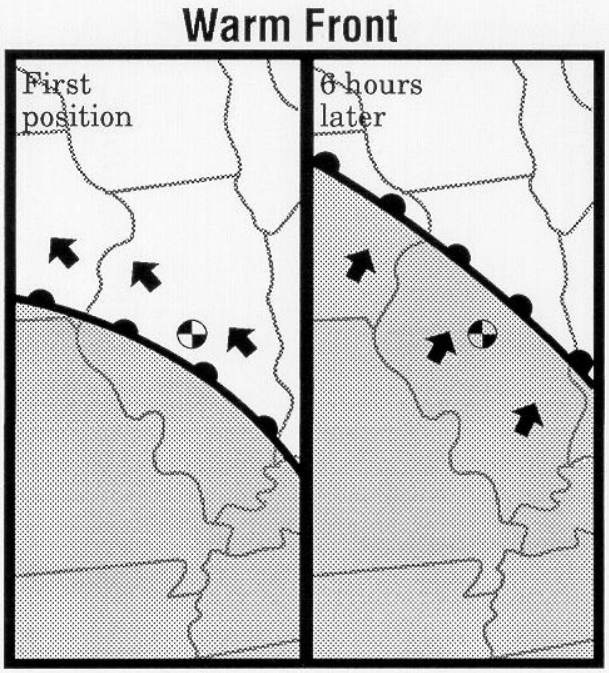

Figure 2. As a warm front passes, wind is steady and shifts gradually, usually from a southeasterly to southwesterly direction.

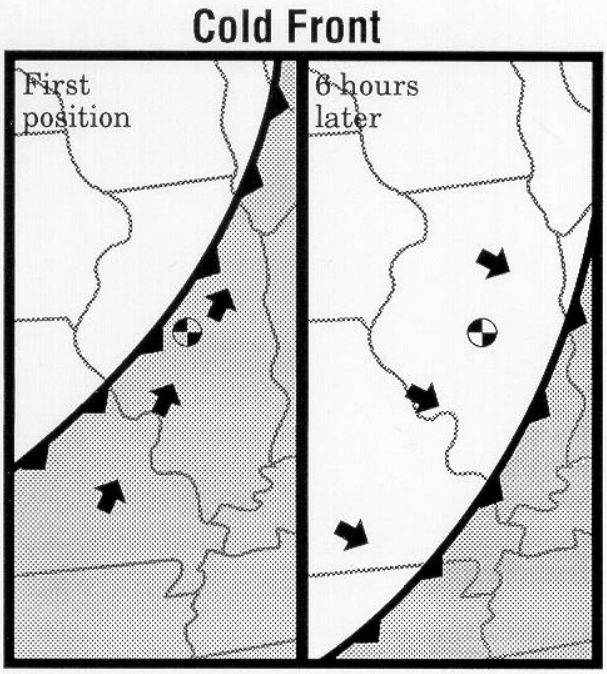

Figure 3. Winds increase ahead of a cold front, become gusty and shift abruptly, usually from a southwesterly to a northwesterly direction, as the front passes.

GENERAL WINDS

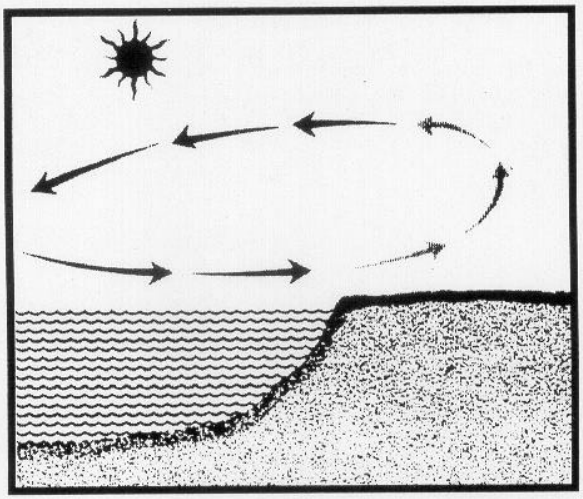

Figure 4. As land surfaces become warmer than adjacent water surfaces during the daytime, and air over the land becomes warm and buoyant, the denser sea breeze begins to flow inland from over the water and forces the less-dense air upward.

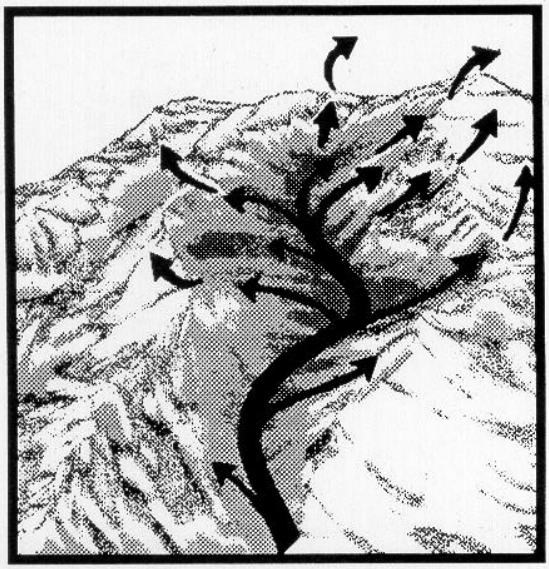

Figure 5. The combined up-slope and up-valley winds proceed during the day and continually divide at each tributary into many up-ravine and up-slope components

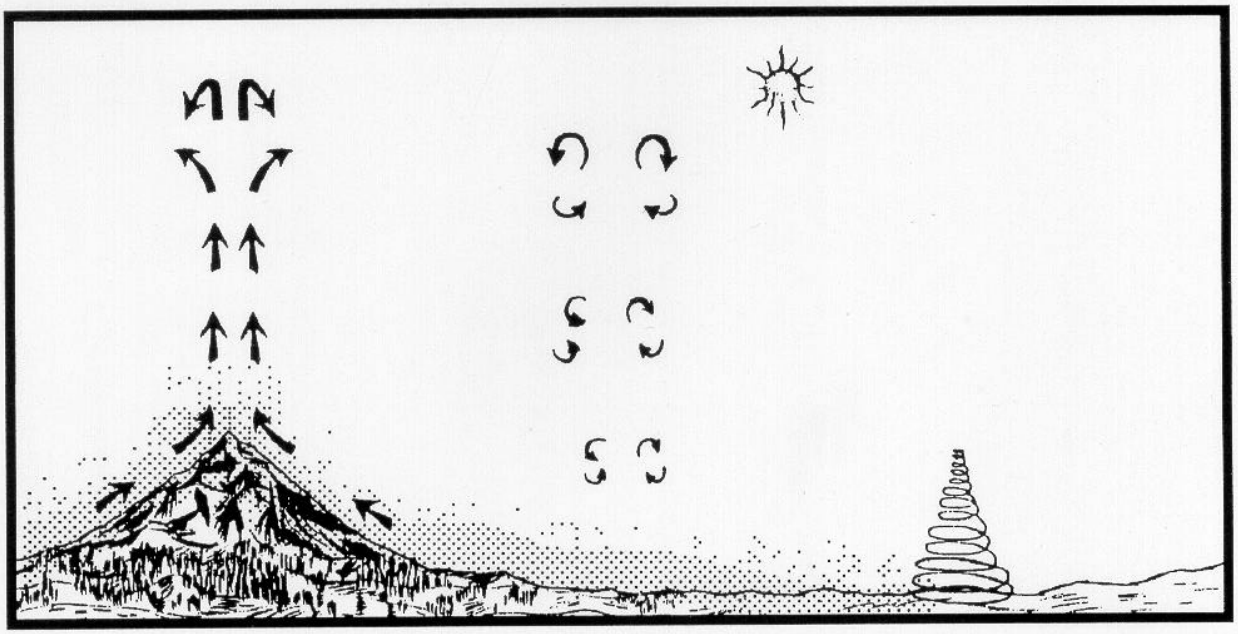

Figure 6. Strong surface heating produces several kinds of convective systems. Up-slope winds develop along heated slopes. Super-heated air in flat terrain escapes upward in bubbles or in the form of whirlwinds or dust devils.

THUNDERSTORMS

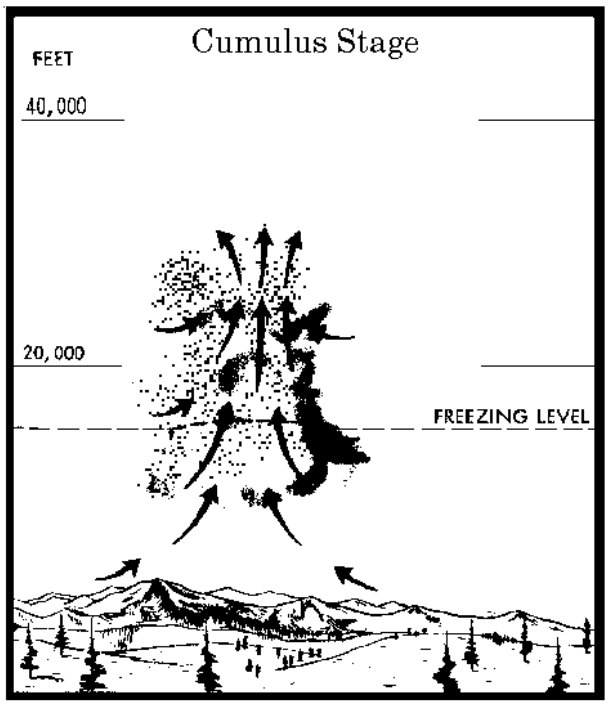

Figure 7. The cumulus stage of a thunderstorm cell is characterized by a strong updraft, which is fed by converging air at all levels up to the updraft maximum. Rain does not occur in this stage.

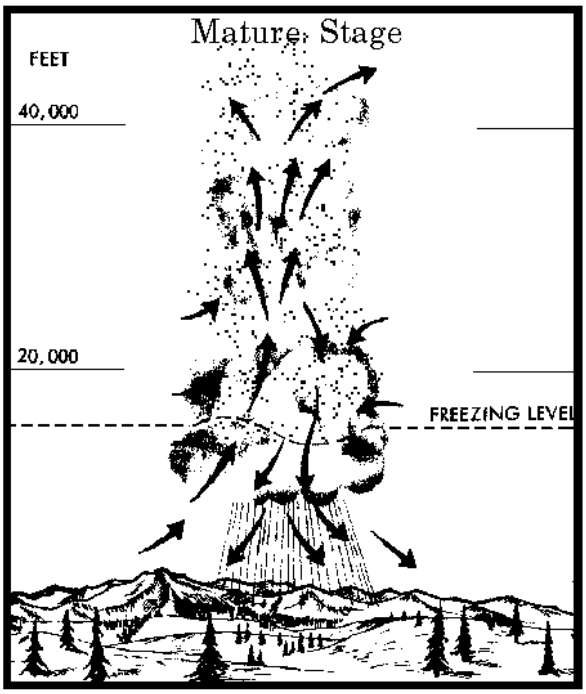

Figure 8. The mature stage, the most active portion of the thunderstorm cycle, begins when rain starts falling out of the base of the cloud. The frictional drag exerted by the rain initiates a downdraft. There is a downdraft in part of the cell and an updraft in the remainder. the updraft is warmer, and the downdraft is colder, than the air surrounding the cell.

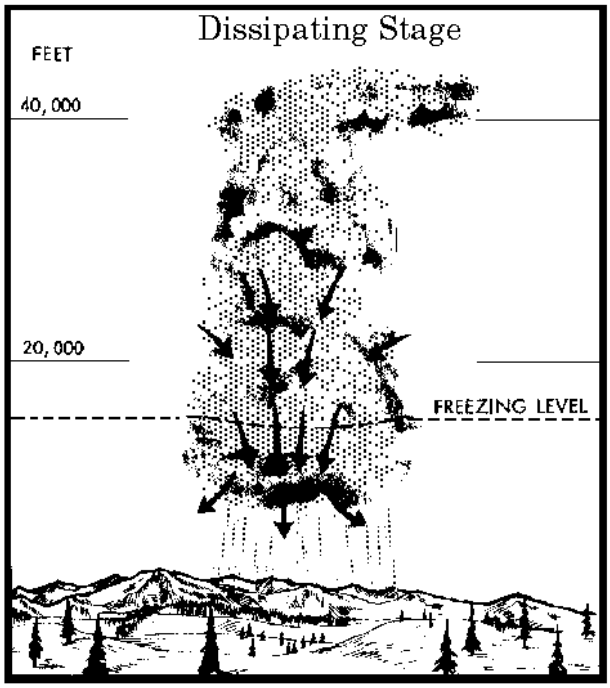

Figure 9. The downdraft spreads over the entire cell, and the updraft disappears in the dissipating stage. Light rain falls from the cloud. Gradually the downdraft weakens, rain ends, and the cloud begins to evaporate.

INVERSIONS

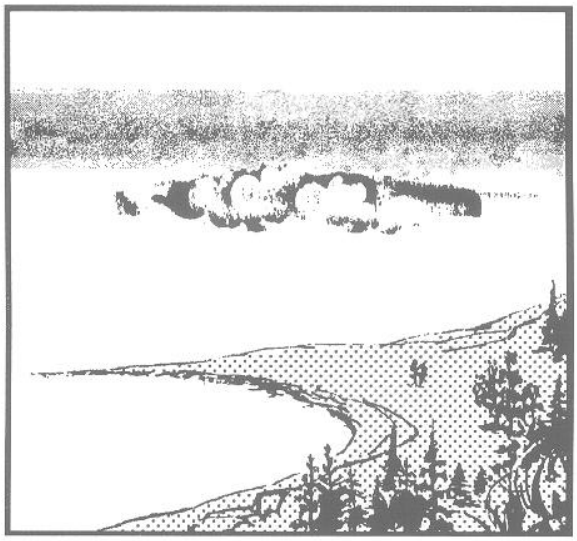

Figure 10. Cool, moist air from the ocean spreads over nearby low-lying land areas beneath the marine inversion.

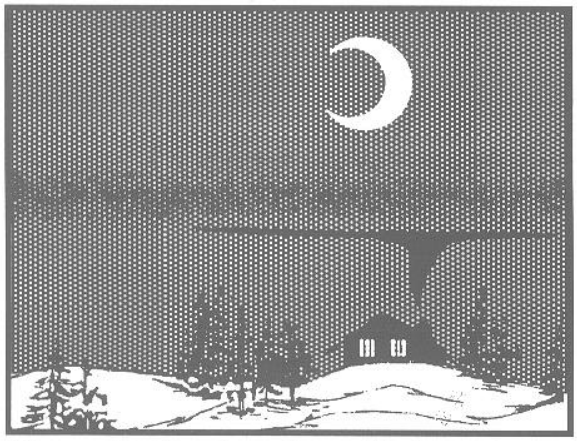

Figure 11. Smoke released into an inversion layer will rise only until its temperature equals that of the surrounding air; then the smoke flattens out and spreads horizontally.

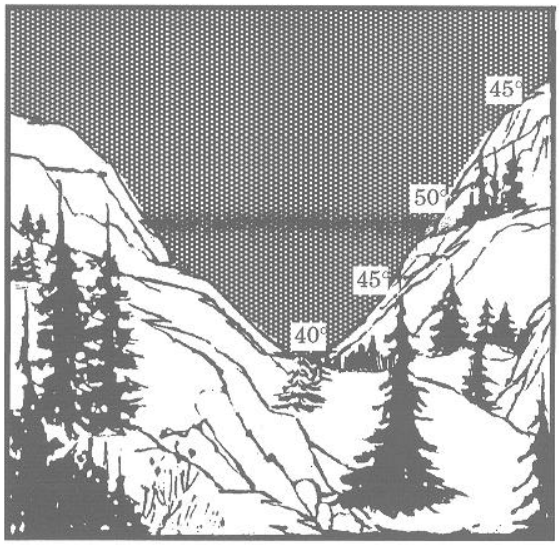

Figure 12. The zone of warm nighttime temperatures near the top of the inversion is known as the thermal belt.