Forces that Affect Atmospheric Motion

Pressure Gradient Force. The difference in atmospheric pressure will cause air to move from high pressure to low pressure. This is something like water flowing down hill or seeking its own level.

Coriolis Force. This is a deflection of the wind caused by the *spinning earth*. The deflection is to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. The result is that air moving out of a high pressure cell or into a low pressure cell will develop a rotation. The Coriolis force also causes *gyres* develop in the oceans.

Gravity. The principal effect of gravity can be seen in *cold air drainage.* As the earth's surface cools at night, cold air will flow down hill. Thus the valleys are always cooler than the hillsides above them.

Friction. Friction is only important for air in contact with the earth's surface in *the planetary boundary layer* (PBL). This is about 1 km thick. The principal effects are in rough terrain, forests, and downtown urban canyons.