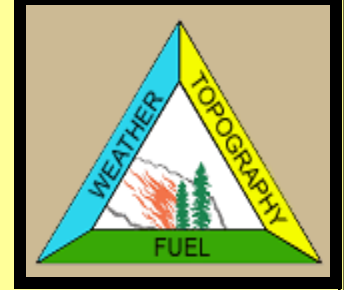




TOPIC 58A

ATMOSPHERIC STABILITY

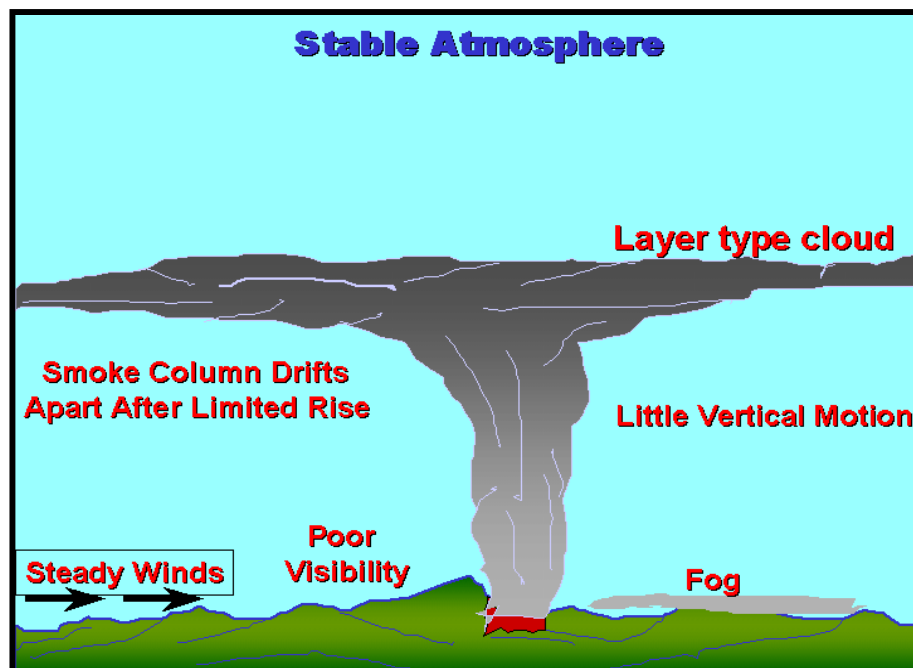
(STABLE ATMOSPHERE)



A **STABLE ATMOSPHERE** (warm air over cold) normally implies a “quiet” fire day but will often produce poor visibility near the fire site by trapping smoke in the lower atmosphere. Anything that upsets this balance of warm air over cold (i.e. a change in the temperature profile) can lead to instability and an increase in fire activity.

Characteristics of a stable atmosphere include the following:

- ✓ Vertical motion suppressed
- ✓ Relatively few clouds
- ✓ Generally dry conditions
- ✓ Steady winds, often light
- ✓ Warm air over cold
- ✓ Often have temperature inversions (temperature increasing with height)
- ✓ Poor visibility in smoke or haze (due to inversions or subsidence)
- ✓ Fire danger often builds in a stable atmosphere
- ✓ Usually little lightning (except for air mass/orographic thundershowers)

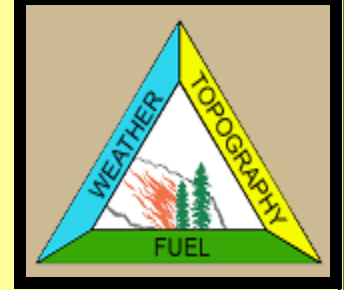




TOPIC 58B

ATMOSPHERIC STABILITY

(UNSTABLE ATMOSPHERE)



An **UNSTABLE ATMOSPHERE** (cold air over warm) produces more active and erratic fire behaviour and can contribute to the development of convective columns within a fire. Instability often leads to gusty and erratic surface winds, which also promote unpredictable fire behaviour. In addition, an unstable atmosphere will promote the development of showers and thundershowers. These can provide any or all of the following: showers to dampen fire behaviour, lightning to enhance ignition potential, and gusty outflow winds.

Characteristics of an unstable atmosphere include the following:

- ✓ Vertical motion
- ✓ The development of convective clouds
- ✓ Light morning winds with gusty afternoon winds as the nocturnal inversion breaks with daytime heating
- ✓ Good visibility during the peak of the burning period
- ✓ Cold air over warm
- ✓ Erratic fire behaviour
- ✓ Lightning
- ✓ Dust devils, fire whirls

