

Maritime Polar

The source region for mP air is over cold ocean currents or high latitude ocean waters. This air does not have as much moisture content as mT air. Since mP air is always near saturation, orographic lifting of the air mass can produce widespread rain or snow. This air mass is notorious for producing fog, drizzle, cloudy weather and long lasting light to moderate rain. The temperature of mP air ranges from just above freezing to below 70 degrees F. mP air is modified as it moves over elevated terrain. On the windward side of mountain ranges, mP air can produce an abundance of rain and snow. Once on the lee side of mountains, the mP airmass modifies into a continental airmass. These air masses produce cold fronts but the air is not as cold as polar or arctic fronts. They are often termed "Pacific fronts" or "back-door cold fronts". Maritime Polar air occurs frequently in the Pacific Northwest and to a lesser degree in New England. mP maritime polar cool, moist, and unstable. mP -- Winter cP air moves over a region such as the NE Pacific, picking up some warmth and moisture from the warmer ocean. In the case of the Pacific NW mountains force the air to rise (orographic lifting) causing rain.

Answer the following: What is the Source Region, Relative Temperature, Wind Direction, and Moisture Content.

Continental Tropical

The source region for cT air is the desert Southwest, the high plains and Mexico with relation to the United States. The air has low dewpoints and warm to hot afternoon temperatures but with mild nighttime temperature. Skies are generally clear in cT air. This allows daytime heating during the day and radiational cooling at night. The cT air mass is most prevalent in summer; in the cool season it is not as discernible. Due to the buoyancy and elevation of cT air across North America, this air will advect into the mid-levels of the atmosphere once it moves out of its source region. This creates a cap of mild dry air. If this air advects over PBL mT air, the severe thunderstorm threat increases significantly. The boundary of cT is most noticeable with the creation of a dryline. A dryline separates mT air from cT air. Depending on the strength of the dryline, convergence along the dryline and the dynamics above the dryline, severe thunderstorms can form near a dryline boundary. cT continental tropical hot, dry, stable air aloft--unstable surface air. cT - Continental tropical air usually only influences the US in summertime as warm, dry air is pumped up off of the Mexican Plateau. It is usually fairly stable and dry, and if it becomes stagnant over the midwest, results in a drought. Deaths associated with the 1995 heat wave in the midwest were the result of cT and mT air which stagnated over the central and eastern part of the US this last summer.

Answer the following: What is the Source Region, Relative Temperature, Wind Direction, and Moisture Content.

Continental Arctic

The source region for Arctic air is northern Canada. It has the same characteristics as Polar air except it is colder with even lower dewpoints. This air often forms when a high pressure area becomes nearly stationary over Eastern Alaska and the Yukon. Due to a near lack of winter solar radiation, abundant surface snow/ice cover and the continuous emission of radiation from the Earth's surface the air will progressively become colder and colder. Temperatures can reach -30 ° F to -60 ° F. If the jet stream becomes meridional during the same time frame Arctic air builds, very cold air will spread into Southern Canada and the US. Once Arctic air moves into the Southern US it modifies to Polar air and then eventually to modified Polar Air behind the cold front boundary. They bring bitterly cold temperatures and dry air to the affected areas. Continental Arctic air masses are separated from continental air masses by an arctic front.

Answer the following: What is the Source Region, Relative Temperature, Wind Direction, and Moisture Content.

Maritime Tropical

The maritime tropical air mass is most often felt in the Southeast U.S. with respect to the United States. In the winter this air mass is shoved toward the equator but in summer it can cover much of the U.S. east of the Rockies. This air mass results from the warm waters of the Gulf of Mexico and Gulf Stream and abundant high angle sunshine. The warm waters in this region evaporate an enormous volume of water. Cold water currents tend to stabilize the atmosphere and produce little evaporation while warm waters destabilize the atmosphere and add moisture. The warm waters conduct heat toward the low levels of the atmosphere. Temperatures in this air mass warm to highs in the 80's and 90's in the summer and the 60's and 70's in winter. High dewpoints (generally greater than 50 F) characterize mT air. The majority of U.S. thunderstorm activity develops within the mT airmass, most being by way of scattered thermodynamic thunderstorms and thunderstorms out ahead of fronts. As the maritime tropical airmass moves over land it begins to "pick up" characteristics of a continental climate. This is particularly true when the mT airmass moves toward the North. The mT airmass modifies due to lower sun angles, drier land below, and cooler land below. mT maritime tropical warm, moist, usually unstable. mT -- wintertime source for the SW US is the subtropical East Pacific Ocean. mT air that influences weather east of the Rocky Mountains comes from the Gulf of Mexico, but only influences winter weather in the SE states. Occasionally, slow moving weather systems in SW flow aloft can draw up moisture at mid and low levels producing precipitation.

Answer the following: What is the Source Region, Relative Temperature, Wind Direction, and Moisture Content.

Continental Polar

The polar airmass has low dewpoints, cold temperatures and a high degree of stability. The denseness of cP air creates surface high pressure and a trough aloft, especially when cP air moves into lower latitudes. Precipitation in association with cP air is usually light due to the dryness and low moisture capacity of the air. Precipitation is most common on the "edges" of cP air, especially where it intersects and displaces mT air. Precipitation within a cP air mass is elevated and dynamically induced. These dynamical uplift mechanisms include jet streaks, isentropic lifting and positive differential vorticity advection. Cold surface temperatures and a dry boundary layer inhibit thermodynamic convection. cP air modifies rapidly as it moves to the South. The dewpoints remain low but the temperature of this airmass increases when moving South due to the following: warmer soil temperature, a shallower airmass, higher sun angles and a lack of surface snow cover. cP air will modify less rapidly if soil temperatures are abnormally low to the south (especially if surface snow cover exists). On some occasions the subtropical jet will "isentropically lift over" the shallow cP air. If this occurs, the cP air will modify less rapidly due to a much-reduced solar heating. Once cP air modifies significantly it no longer makes sense to label it Polar air. After modification, cP air becomes modified cP air or modified mid-latitude continental air. cP continental polar cold, dry, stable. cP -- wintertime bitter cold can extend to Southern US and even Florida causing crop damage. Require long, clear nights, which means strong radiational cooling of air near the surface. A stable air mass. Little moisture added so air is dry.

Answer the following: What is the Source Region, Relative Temperature, Wind Direction, and Moisture Content.