

# USA Glossary of Features

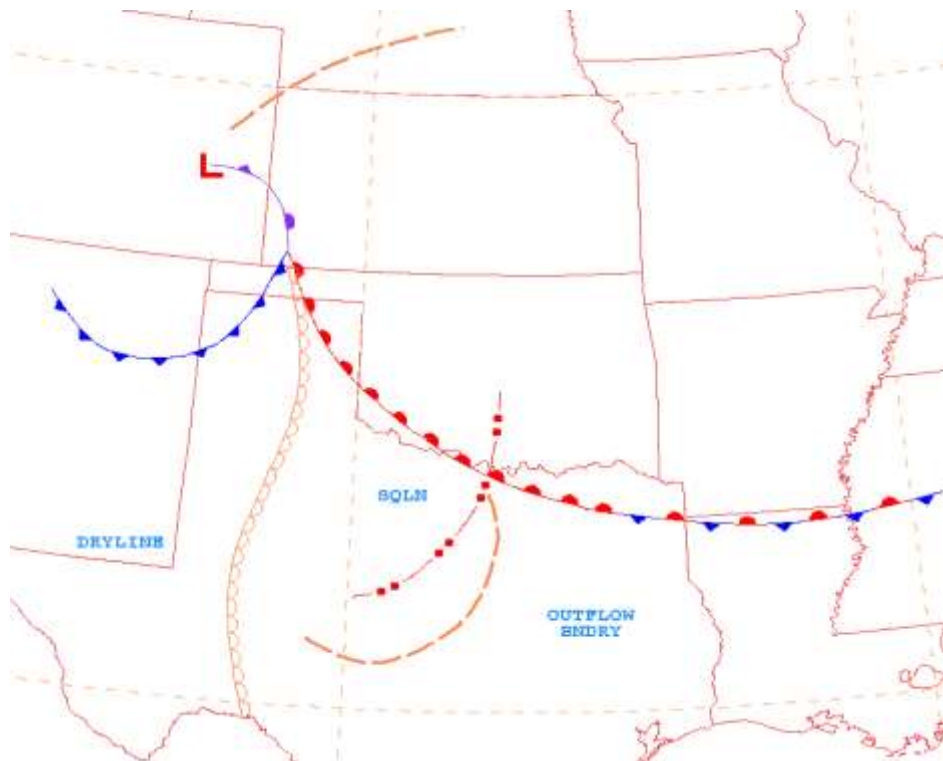
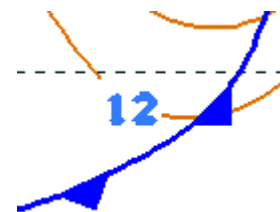


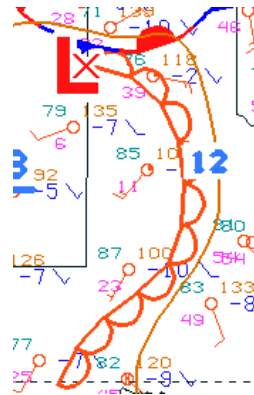
Figure 1. Idealized depiction of features that could be seen on the Unified Surface Analysis in the Mid-Latitudes

## 1. Features Depicted and their related definitions

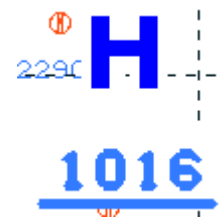
**Cold Front:** The leading, progressive edge of a density discontinuity ahead of a cooler/drier air mass. These boundaries tend to be narrower than warm fronts due to the higher density low-level air in their wake which helps drive their forward motion. Over the continent, a minimum of 6C (10F) over 500 km (300 nm) is usually needed for a frontal zone with smaller differences needed over the oceans. It is depicted as a blue line with periodic spikes facing into the warmer air mass.



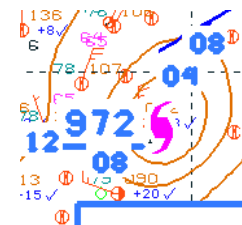
**Dryline:** The leading edge of a significant density/dewpoint discontinuity forced by foehn winds off the Rockies, usually ahead of a significant synoptic scale system moving through the West/Southwest. They usually progress eastward during the heating of the day, and westward at night. A tight 14C (25F), or a broader 17C (30F), dewpoint gradient is used to help determine the existence of a dryline. The dryline does not have to be the leading edge of all the change in the dewpoint, merely where the best gradient/leading edge of foehn winds exists (mainly after Bluestein). A dryline is drawn as a brown line with scallops facing into the moist air mass.



**High Pressure System:** A relative maximum in the pressure pattern, usually accompanied by at least one closed isobar, which normally has an outward, clockwise circulation from its center in the Northern Hemisphere and an outward, counterclockwise circulation in the Southern Hemisphere. It is depicted as a blue H with its central pressure underlined nearby its placement.



**Hurricane/Typhoon.** A tropical cyclone in which the maximum sustained surface wind (1-minute mean) is 64 kts (74 mph) or more. The term hurricane is used for Northern Hemisphere tropical cyclones east of 180° longitude to the Greenwich Meridian. The term typhoon is used for Pacific tropical cyclones north of the Equator west of the International Dateline. Labeled as TYPH, HURCN, or HRCN on the Unified Surface Analysis.



**Intertropical Convergence Zone.** A zonally elongated axis of surface wind confluence in the tropics, due to confluence of northeasterly and southeasterly trade winds, and/or confluence at the poleward extent of cross-equatorial flow into a near-equatorial heat trough. It is depicted as a pair of ref lines with cross hatching. The feature is labeled as ITCZ on the Unified Surface Analysis.



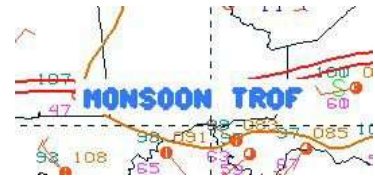
**Low Pressure System:** A relative minimum in the pressure pattern, usually accompanied by at least one closed isobar, which normally has an inward, counterclockwise circulation in the Northern Hemisphere and an inward, clockwise circulation in the Southern Hemisphere. It is depicted as a red L with an x at its center of circulation with its central pressure underlined nearby its placement.



**Maximum 1-Minute Sustained Surface Wind.** When applied to a particular weather system, refers to the highest 1-minute average wind speed (at an elevation of 10 m with an unobstructed

exposure) associated with that weather system at a particular point in time.

**Monsoon Trough:** an elongated area of low pressure along the Intertropical Convergence Zone (ITCZ) that leads to an enhancement of monsoon precipitation over land. To its south lie southwesterly low-level winds, as opposed to the ITCZ which is a confluent zone of easterly winds. The monsoon trough is the main focus for tropical cyclogenesis in the northwest Pacific ocean, and plays less of a role in tropical cyclone formation across the northeast Pacific, western Caribbean sea, and northeast Atlantic ocean. This feature is depicted in red with a set of two parallel lines, showing the location of minimum sea level pressure. This feature is labeled MONSOON TROF on the analysis.



**Occluded Front:** A front that forms southeast/east of a cyclone that moves deeper into colder air, in the late stages of wave-cyclone development. Cold occlusions result when the coldest air surrounding the cyclone is behind its cold front, and are normally seen on the west sides of ocean basins and with clipper systems descending from the arctic. Warm occlusions form when the coldest air surrounding the cyclone is ahead of its warm front, forcing the cold front aloft. Warm occlusions are normally seen on the east side of ocean basins and just to the lee of the United States portion of the continental divide (mainly after Glickman 2000). It is depicted as a purple line with alternating bumps and spikes.



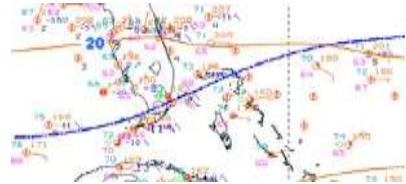
**Outflow Boundary:** A mesoscale surface boundary formed by the horizontal spreading of thunderstorm-cooled air. These features may last more than a day (after Glickman 2000). It is normally depicted as a trough with a label of “OUTFLOW BNDRY”



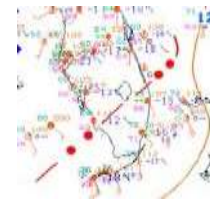
**Post-tropical Cyclone:** A former tropical cyclone. This generic term describes a cyclone that no longer possesses sufficient tropical characteristics to be considered a tropical cyclone. Post-tropical cyclones can continue carrying heavy rains and high winds. Note that former tropical cyclones that have become fully extratropical...as well as remnant lows...are two classes of post-tropical cyclones. It is depicted on the Unified Surface Analysis in the same manner as a low pressure area.

**Remnant Low:** A post-tropical cyclone that no longer possesses the convective organization required of a tropical cyclone...and has maximum sustained winds of less than 34 kts (39 mph). The term is most commonly applied to the nearly deep-convection-free swirls of stratocumulus in the eastern North Pacific. It is depicted on the Unified Surface Analysis in the same manner as a low pressure area.

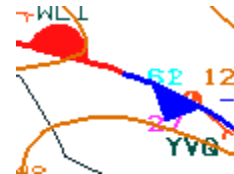
**Shearline:** The final stage in the life cycle of a cold front over the subtropics and tropics. Lying equatorward of the subtropical ridge, these boundaries have lost all temperature contrast over the warm ocean and have minimal dewpoint contrast across them. They delineate an area where wind speed quickly increases on the poleward side of the boundary by 10+ knots from nearly the same direction (within 45 degrees) within a 60-90 nm zone. As mid- and high-level cloudiness previously associated with the front has dissipated due to lack of upper-level support, a shearline is indicated on satellite imagery as the leading edge of a line of low-level clouds with tops near 10,000 ft (3,040 m). Shearlines lie in troughs, but as surface data over the subtropical/tropical ocean is sparse, the trough may not be recognized in the available surface observation field. Using streamline analysis, a shearline is denoted by a confluence of streamlines equatorward and west of the col area where a cold front divides the subtropical ridge. The symbol for shearline is an alternating dot-dash pattern, in the color of blue.



**Squall Line:** A solid line of convection, usually associated with rapid pressure fluctuations and high winds. The squall line will normally be placed at the leading edge of the wind shifts and inside the leading pressure trough. The symbol for squall line is an alternating two dot-dash pattern, in the color of red.



**Stationary Front:** The equatorward edge of a slow-moving density discontinuity with a motion of less than 10 knots (12 mph). Winds tend to lie parallel to these boundaries. Over the continent, a minimum of 6C (10F) over 500 km (300 nm) is usually needed for a frontal zone with smaller differences required over the oceans. It is depicted with alternating red bumps and blue spikes.



**Subtropical Cyclone.** A low pressure system that develops over subtropical waters that initially has a non-tropical circulation but in which some elements of tropical cloud structure, such as deep convection, are present. On the map, it is depicted with an Lx symbol, like other low pressure areas.

- The most common type is an upper-level cold low with a circulation extending to the surface layer and maximum sustained winds generally occurring at a radius of about 100 miles or more from the center. In comparison to tropical cyclones, such systems have a relatively broad zone of maximum winds that is located farther from the center, and typically have a less symmetric wind field and distribution of convection.
- A second type of subtropical cyclone is a mesoscale low originating in or near a frontolyzing zone of horizontal wind shear, with radius of maximum winds generally less

than 30 miles. The entire circulation may initially have a diameter of less than 100 miles. These generally short-lived systems may be either cold core or warm core.

- Subtropical cyclones which attain maximum sustained winds above 64 knots (74 mph) usually attain sufficient tropical characteristics to be considered hurricanes.

**Subtropical Depression.** A subtropical cyclone in which the maximum sustained winds speeds (1-minute mean) is 33 kts (38 mph) or less. Labeled as SUB T.D. on the Unified Surface Analysis.

**Subtropical Storm.** A subtropical cyclone in which the maximum sustained winds speeds (1-minute mean) are between 34 kts (39 mph) and 63 kts (73 mph). On the Unified Surface Analysis, it is depicted with a tropical storm symbol and labeled SUB T.S.

**Super Typhoon.** A “super” typhoon is a tropical cyclone that is classified as having winds of 130 kts (150 mph) or greater. This term is only used by the Joint Typhoon Warning Center for strong tropical cyclones in the northwest Pacific ocean. Labeled as STYPH on the Unified Surface Analysis.



**Tropical Cyclone.** A warm core, non-frontal, synoptic scale cyclone originating over tropical or subtropical waters, with organized deep convection and a closed surface wind circulation about a well-defined circulation.

**Tropical Depression.** A tropical cyclone in which the maximum sustained winds speeds (1-minute mean) is below 34 knots (39 mph). Labeled as T.D. on the Unified Surface Analysis.

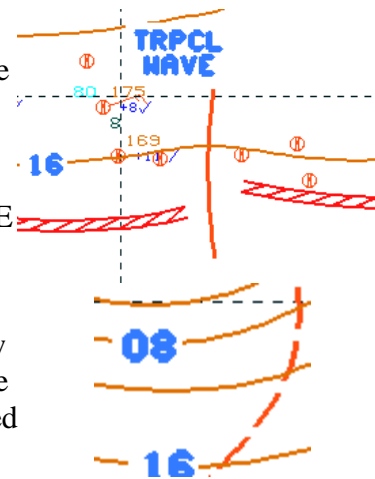


**Tropical Disturbance.** A discrete tropical weather system of apparently organized convection - generally 100 to 300 nmi (185 to 555 km) in diameter - originating in the tropics or subtropics, having a non-frontal migratory character, and maintaining its identity for 24 hours or more. It may or may not be associated with a detectable perturbation of the wind field.

**Tropical Storm.** A tropical cyclone in which the maximum sustained winds speeds (1-minute mean) are between 34 knots (39 mph) and 63 knots (73 mph). Labeled as T.S. on the Unified Surface Analysis.



**Tropical Wave.** A trough or cyclonic curvature maximum in the trade-wind easterlies. The wave may reach maximum amplitude in the lower middle troposphere or may be the reflection of an upper tropospheric cold low or equatorial extension of a middle latitude trough. They are labeled with the words TRPCL WAVE or TROPICAL WAVE on the unified analysis.



**Trough:** An elongated area of low pressure with no distinct low level center. Winds usually flow cyclonically through it, outside of terrain influences. A trough is drawn as a wide orange, dashed line.

**Warm Front:** The equatorward edge of a density discontinuity behind a retreating and modified cool, dry air mass. This type of frontal zone is significantly broader than a cold front, due to the slower erosion of the superior density airmass ahead of the boundary. Over the continent, a minimum of 6C (10F) over 300 nm (500 km) is usually needed for a frontal zone while smaller differences are necessary over the oceans. It is depicted as a red line with periodic bumps facing into the cooler air mass.

