

= Inflow ( meteorology ) =

Inflow is the flow of a fluid into a large collection of that fluid . Within meteorology , inflow normally refers to the influx of warmth and moisture from air within the Earth 's atmosphere into storm systems . Extratropical cyclones are fed by inflow focused along their cold front and warm fronts . Tropical cyclones require a large inflow of warmth and moisture from warm oceans in order to develop significantly , mainly within the lowest 1 kilometre ( 0 @. @ 62 mi ) of the atmosphere . Once the flow of warm and moist air is cut off from thunderstorms and their associated tornadoes , normally by the thunderstorm 's own rain @-@ cooled outflow boundary , the storms begin to dissipate . Rear inflow jets behind squall lines act to erode the broad rain shield behind the squall line , and accelerate its forward motion .

= = Thunderstorms = =

Cool air , carried to the ground by thunderstorm downdraft , cuts off the inflow of the thunderstorm , destroying its updraft and causing its dissipation . Tornadoes , which form within stronger thunderstorms , grow until they reach their mature stage . This is when the rear flank downdraft of the thunderstorm , fed by rain @-@ cooled air , begins to wrap around the tornado , cutting off the inflow of warm air which previously fed the tornado . When thunderstorms are able to organize into squall lines , a feature known as a rear inflow jet develops to the south of the mid @-@ level circulation associated with its northern bookend vortex . This leads to an erosion of rain within the broad rain shield behind the squall line , and may lead to acceleration of the squall line itself .

= = Tropical cyclones = =

While an initial warm core system , such as an organized thunderstorm complex , is necessary for the formation of a tropical cyclone , a large flux of energy is needed to lower atmospheric pressure more than a few millibars ( 0 @. @ 10 inch of mercury ) . Inflow of warmth and moisture from the underlying ocean surface is critical for tropical cyclone strengthening . A significant amount of the inflow in the cyclone is in the lowest 1 kilometre ( 3 @, @ 300 ft ) of the atmosphere .

= = Extratropical cyclones = =

Polar front theory is attributed to Jacob Bjerknes , and was derived from a coastal network of observation sites in Norway during World War I. This theory proposed that the main inflow into a cyclone was concentrated along two lines of convergence , one ahead ( or east ) of the low and another trailing equatorward ( south in the Northern Hemisphere and north in the Southern Hemisphere ) and behind ( or west ) of the low . The convergence line ahead of the low became known as either the steering line or the warm front . The trailing convergence zone was referred to as the squall line or cold front . Areas of clouds and rainfall appeared to be focused along these convergence zones . A conveyor belt , also referred to as the warm conveyor belt , is a term describing the flow of a stream of warm moist air originating within the warm sector ( or generally equatorward ) of an extratropical cyclone in advance of the cold front which slopes up above and poleward ( north in the Northern Hemisphere and south in the Southern Hemisphere ) of the surface warm front . The concept of the conveyor belt originated in 1969 .

The left edge of the conveyor belt is sharp due to higher density air moving in from the west forcing a sharp slope to the cold front . An area of stratiform precipitation develops poleward of the warm front along the conveyor belt . Active precipitation poleward of the warm front implies potential for greater development of the cyclone . A portion of this conveyor belt turns to the right ( left in the Southern Hemisphere ) , aligning with the upper level westerly flow . However , the western portion of this belt wraps around the northwest ( southwest in the Southern Hemisphere ) side of the cyclone , which can contain moderate to heavy precipitation . If the air mass is cold enough , the precipitation falls in the form of heavy snow . Theory from the 1980s talked about the presence of a

cold conveyor belt originating north of the warm front and flowing along a clockwise path ( in the northern hemisphere ) into the main belt of the westerlies aloft , but there has been conflicting evidence as to whether or not this phenomenon actually exists .