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Tule fog

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Tule fog (pronounced /ˈtuːliː/) is a thick ground fog that settles in the [San Joaquin Valley](#) and [Sacramento Valley](#) areas of [California's Great Central Valley](#). Tule fog forms during the late [fall](#) and [winter](#) (California's [rainy season](#)) after the first significant rainfall. The official time frame for tule fog to form is from November 1 to March 31. This phenomenon is named after the [tule grass](#) wetlands (*tulares*) of the Central Valley. Accidents caused by the tule fog are the leading cause of weather-related casualties in California.

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Formation

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This section does not [cite](#) any [references or sources](#). Please help [improve this article](#) by adding citations to [reliable sources](#). Unsourced material may be [challenged](#) and [removed](#). *(March 2010)*

Tule fog is a [radiation fog](#), which condenses when there is a high [relative humidity](#) (typically after a heavy rain), calm winds, and rapid cooling during the night. The nights are longer in the winter months, which creates rapid ground cooling, and thereby a pronounced temperature inversion at a low altitude.


In California, tule fog can extend from [Bakersfield](#) to [Red Bluff](#). Tule fog occasionally drifts as far west as the [San Francisco Bay Area](#), even drifting westward out the [Golden Gate](#), opposite to the usual course of [summertime ocean fog](#).

It is formed when cold mountain air flows downslope into the valley during the night, pooling in the low areas until it fills the valley to the "brim" formed by the Coast Ranges and the Sierra Nevada. This occurs because most areas in the Great Central Valley have little or no air drainage below the level of mountain passes. Because of the density of the cold air in the winter, winds are not able to dislodge the fog and the high pressure of the warmer air above the mountaintops presses down on the cold air trapped in the valley, resulting in a dense, immobile fog that can last for days or at times



Dense Tule fog in [Bakersfield, California](#). Visibility in this photo is less than 500 feet. 



Tule fog settled on an [orchard](#) in [Stanislaus County](#) in late December. 

Cited in Stacy v. Rederiet Otto Danielsen, No. 09-15579 archived on July 2, 2010

for weeks undisturbed. Tule fog often contains light drizzle.

Tule fog is a low cloud, usually below 1,000 feet in [altitude](#) and can be seen from above by driving up into the [foothills](#) of the [Sierra Nevada](#) to the east or the [Coast Ranges](#) to the west. Above the cold, foggy layer, the air is typically warm, dry and clear. Once tule fog is formed, turbulent air is necessary to break through the temperature inversion layer. Daytime heating sometimes evaporates the fog in some areas, although the air remains chilly and hazy below the inversion and reforms right after sunset. Tule fog usually remains longer in the southern and eastern parts of the Central Valley because more winter storms affect the northern Central Valley.

Visibility

[[edit](#)]

Visibility in tule fog is usually less than an eighth of a [mile](#) (about 600 [feet](#) or 200 [meters](#)), but can be as little as a foot (about 30cm.) Visibility can vary rapidly; in only a few feet visibility can go from 10 feet to near zero.^[1]

The variability in visibility is the cause of many chain-reaction pile-ups on roads and freeways. In one such accident on [Interstate 5](#) near [Elk Grove](#) south of [Sacramento](#), 25 cars and 12 big-rig trucks collided inside a fog bank in December 1997. Five people died and 28 were injured. In February 2002, two people were killed in an 80-plus car pile-up on [State Route 99](#) between [Kingsburg](#) and

[Selma](#). The visibility at the time of the accident was zero. On the morning of November 3, 2007, heavy tule fog caused a massive pile-up that included 108 passenger vehicles and 18 big rig trucks on Northbound [State Route 99](#) between [Fowler](#) and [Fresno](#). Visibility was cut to about 200 feet at the time of the accident. There were two fatalities and 39 injuries in the crash.^[2]



Tule fog in [Bakersfield, California](#)

Freezing drizzle and black ice

[[edit](#)]

Lack of visibility in tule fog is hazardous enough, but these fog events are often accompanied by drizzle and freezing drizzle. Because of the lack of sunlight penetrating the fog layer, temperatures may struggle to climb above freezing, and episodes of [freezing drizzle](#) occasionally accompany tule fog events during winter. Such events can leave an invisible glaze of [black ice](#) on roadways, making travel especially treacherous.

References

[[edit](#)]

- ↑ <http://www.wrh.noaa.gov/hnx/newslet/winter00/fogseason.htm>
- ↑ [abc30.com: Highway 99 Back Open After Massive Pileup 11/03/07](#)

External links

[[edit](#)]

- [Page on tule fog](#) from the [National Oceanic and Atmospheric Administration \(NOAA\)](#)
- [Forecasting Radiation Fog](#) University Corporation for Atmospheric Research

Categories: [Fog](#) | [Central Valley of California](#)

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