

Southeastern Alaska Thunderstorm Climatology

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Although thunderstorms are not necessarily the first thing that comes to mind when one thinks about the weather in southeastern Alaska, they do occur in this part of the state. Although they do not occur as frequently in this region as they do in other places such as the interior of Alaska or the Lower 48 states, they are still capable of causing problems when they do occur. Lightning poses many hazards, particularly with regard to marine vessels, as well as the risk of starting forest fires. Heavy rain can cause flash flooding, particularly in the mountainous terrain of southeast Alaska and reduced visibilities can affect aircraft traffic. Since these are dangers that are of particular importance to this region, it is important to know about the frequency of these phenomena as well as the time of year and conditions in which they occur so that the public may be more aware of them.

Southeastern Alaska is a large area, stretching over 300 miles from Yakutat southeast to Ketchikan. Therefore, it should not be surprising that there can be variations in climate over such a large region. This is most definitely the case with the climatology of thunderstorms. Weather records from 1970 through 2001 at three stations; Yakutat, Juneau, and Annette Island were examined and thunderstorm days were noted. During the period, Juneau recorded a total of 16 storms, resulting in an average of one thunderstorm every 1.9 years. In this same period, Yakutat showed markedly greater activity with 95 thunderstorms, giving an average of 3.1 thunderstorms *per year*. The station at Annette Island near Metlakatla was in the middle, recording 33 thunderstorms - an average of exactly 1.1 thunderstorms per year. It is clear that both Yakutat and Annette Island have much greater thunderstorm activity than Juneau. The close proximity of Yakutat to the open waters of the Gulf of Alaska allows for increased instability in the atmosphere which in turn is responsible for the larger number of thunderstorms found there. On the other hand Juneau, which is farther from the open ocean, is less prone to thunderstorms of this type since cold fronts from the North Pacific are generally stronger and more unstable near the outer coast. The thunderstorm activity that is found in Juneau is usually triggered by daytime heating and does not generally come in from off of the ocean but up from the south or even over the Coast Range from Canada. Annette Island falls in between the other two locations in that though it is not directly on the Gulf, it is open to the waters south of it. Thus it can be affected by both types.

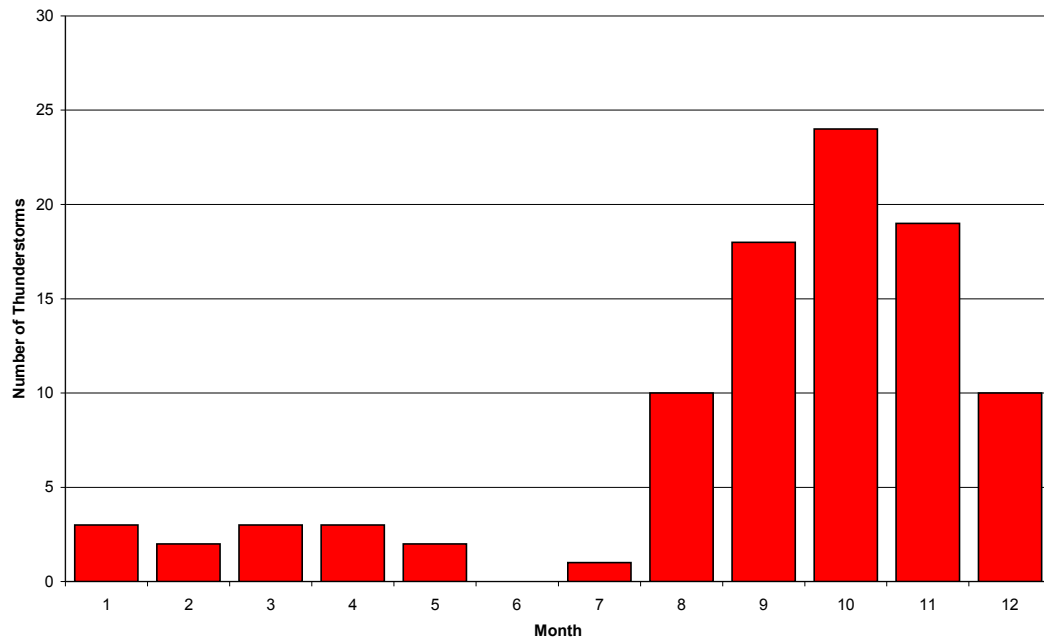
The time of year also plays an important factor in the occurrence of thunderstorms in southeast Alaska. Just as the number of storms varies across the region, so does the time of year during which these storms usually form. In Juneau, the summer months of June and July are the primary thunderstorm months. It is during this time on a few occasions that daytime heating becomes intense enough to allow for the formation of thunderstorms. Yakutat on the other hand, finds its period of most intense thunderstorm activity in the fall, peaking between the months of September and the end of November. During this time, fall storms are beginning to move through the region. When a particularly cold region of air comes down out of the north towards Yakutat, it encounters the warmer waters and subsequently warmer air of the Gulf of Alaska.

Since Yakutat is often at the interface between these two masses of air, it can receive several thunderstorms per year. At Annette Island, the peak time for thunderstorm formation was found to be August, when daytime heating allows for thunderstorms to form in a similar manner to Juneau. However, there is also a second peak similar to Yakutat's, that is delayed until later in November. This is most likely due to the fact that being located so far south, Annette Island stays warmer longer, so strong fall and winter fronts are delayed by about one month.

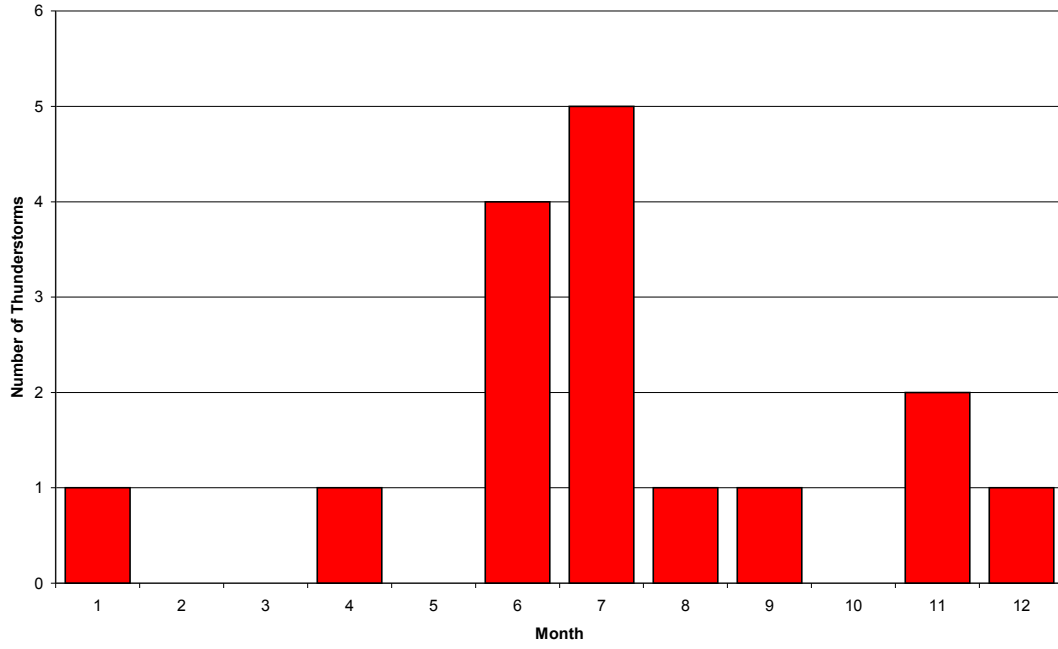
As one can see, though southeastern Alaska does not experience as much thunderstorm activity as other parts of the state and nation, it is possible, under the right conditions, for thunderstorms to form in this region. This formation demonstrates considerable variability over southeastern Alaska in terms of both the quantity of storms as well as the time during which they form. With a better understanding of when to expect thunderstorms, the public is better equipped to take precautions against thunderstorms to protect themselves from the hazards that these phenomena can pose when they do strike.

	Total (1970-2000)	30 Yr Average
Yakutat	95	3.17
Juneau	16	.53
Annette	33	1.10

Yakutat Thunderstorms 1973-2001



Juneau Thunderstorm 1970-2000



Annette Thunderstorms 1970-2000

