

(1)

OUTLINE OF CLOUDS

Type	*Range of altitude (ft.)	Accompanying Precipitation	Turbulence	Icing above Freezing pt.
Cirrus (Ci)	10,000-30,000	None	Probably a little	None
Cirrostratus (Cs)	10,000-30,000	None	None	None
Cirrocumulus (Cc)	10,000-30,000	None	Some turbulence	None
Altostratus (As)	6,000-20,000	Steady rain or snow usually begins from As.	Usually none	Light to moderate
Alto cumulus (Ac)	6,000-20,000	Usually none, but occasionally very light showers or snow flurries	Mild to moderate	Light to moderate
Stratocumulus (Sc)	1,000-6,000	Light showers or snow flurries	Mild	Light to moderate
Stratus (St)	gr. level to 6000	Drizzle or light snow (may last many hours)	None	Light
Nimbostratus (Ns)	100-6000	The rain cloud. Continuous or intermittent rain or snow, which may be heavy	Mild or none	Light
Cumulus (Cu)	1,000-30,000	Usually none. From towering Cu, light or moderate showers may occur	Mild to severe (towering Cu, severe)	Light to heavy
Cumulonimbus (Cb)	1,000-35,000	Heavy showers, hail (lightning and thunder. Frequently wind.)	May be very severe	May be very heavy

* Clouds are higher in summer than in winter, and are higher at the equator than at the poles.

OPTICAL PHENOMENA OF CLOUDS

Type	Optical Phenomena
Ci	Does not obscure sun or moon appreciably. Outline of sun or moon always discernible through Ci.
Cs	May somewhat dim sun or moon. Outline of sun or moon discernible through all but the thickest Cs. When Cs sheet is extensive, halo of radius 22 degrees around sun or moon is produced. With heavy Cs, additional halo phenomena appear.
Cc	Does not usually dim sun or moon, but may occasionally cast shadows on itself resulting in the appearance of dark striation. Iridescence (that is, a multi-colored glow) in vicinity of sun may be seen with Cc, but is rare.
As	Unless very thin, As obscures outline of the sun or moon. The sun may shine feebly, appearing as if through ground glass, but is completely hidden by thicker As. Halos are never seen except with cirriform clouds, but through thin altostratus a bright patch, which may be colored, of radius one or two degrees, may be seen surrounding the sun or moon. This is called a corona.
Ns	Shines with a faint light colored glow as if lighted from within.
Cb	The same kind of glow may be seen in Cb clouds, but may be colored saffron or, rarely, green in severe storms.
Ac) Sc) St) Cu)	No special optical phenomena

Note: Shadows on the ground of nearby objects in sunlight or moonlight usually scarcely affected by Cirriform clouds or by thin altostratus, but disappear completely with other types of clouds, including the densest cirrostratus.

WHAT THE CLOUDS ARE LIKELY TO MEAN IN WEATHER SEQUENCES

Ci) These three types of clouds always are thrown as much as 1000 miles
 Cs) ahead of hurricanes and the most severe extratropical cyclones. Less
 Cc) severe cyclones throw them less far. Cirrus is frequently the first
 sign of an approaching disturbance, especially if the Ci thickens
 progressively into Cs, and more especially if this is accompanied by
 Cc. However, these clouds are not invariable indicators of coming
 bad weather.

As In one major kind of deterioration from good weather to bad, heavy
 Cs is followed by progressively thickening As (perhaps with some
 characteristics of Ac). The precipitation begins after the As has
 reached considerable density, and then Ns appears.

Ns Major precipitation falls from a Ns layer.

Ac In another type of deterioration, a more or less continuous sheet
 of Ac may move in. It may or may not have been preceded by cirriform
 clouds. This Ac may later merge into As and precipitation begin,
 changing later to Ns; or in some cases, may give way to clearing
 without precipitation from the As, or even without formation of
 As at all. As a rule, this type of deterioration is more rapid
 but less threatening than the kind discussed above.

In one type of clear-off after a period of bad weather, the precipi-
 tation from the Ns may cease and the Ns change fairly rapidly
 to Ac, which then breaks up without much delay. This is the most
 rapid major type of clear-off, and is commoner in summer than in
 winter.

Sc In the second major type of improvement, Ns gradually changes into
 Sc which may last for several hours, or even a day or more. This
 is a slower type of clear-off and is rather common in the cooler
 part of the year. There is likely to be considerable wind and a
 drop in temperature. The Sc persists longer in mountainous than
 in level country.

There is also another type of deterioration in which the As is pre-
 ceded by Sc, especially in summer and fall.

The above types of clouds are the ones which appear
 in the most common weather sequences week after week. However
 there are other types of clouds which may appear at certain
 times.

St St is a bad weather cloud from which relatively little precipitation
 falls. Stratus precipitation may last for a considerable period of
 time, however, Ns may sometimes change to St with almost cessation
 of the precipitation. Or St may develop instead of Ns in a deterior-
 ation.

WHAT THE CLOUDS MEAN IN WEATHER SEQUENCES, continued

- Cu Cu may be found in all sorts of weather situations, although it is much less common in winter than in summer. In summer, Cu frequently builds up into thunderstorms (see Cb). In certain clear-offs Sc breaks up into Cu which soon dissipates.
- Cb Cb is the thunderstorm cloud. Cb and towering cumulus are the only clouds that produce thunder and lightning. Cb is to be expected along cold fronts in summer. Thunderstorms need to be considered separately in detail. Cb is the thickest of all clouds, extending in altitude from a few hundred feet above the ground to 35,000 feet or more.

IMPORTANT The above descriptions of the role of clouds in weather sequences apply particularly to the two temperate zones, latitude 30° to 60°, north and south.