

1. AMOUNT OF PRECIPITATION  
2. DISPERSION OF PRECIPITATION

1. Amount of Precipitation

Precipitation is the general term for the substance which falls on the ground surface in the form of rain, snow, snow pellets and hail as a result of the condensation of water vapor in the air. The amount of precipitation represents the volume in water form. The amount of precipitation is observed once a day (0900 hours) and the amount of precipitation during the preceding 24 hours is recorded. This recorded figure is shown in units of 0.1 mm and represents the amount of precipitation for the previous day.

Precipitation differs to a great extent, depending on the region, with marked differences in local areas. There also is a wide degree of the dispersion of annual changes in the monthly or annual amount of precipitation. Its norms, unlike those of mean temperature, are used merely as a yardstick.

There is heavy precipitation in the areas on the Pacific Ocean side, such as Kyūshū, Shikoku and Kii Hantō, from June through August, whereas the amount of precipitation from snow is great in the districts on the Japan Sea side from Akita to Tottori, from December to February. On the other hand, the amount of precipitation is small in the inland areas, including the eastern part of Hokkaidō, the Kitakami lowlands and the northern part of the Kantō Region; the basins, including Hukusima, Nagano and Kōhū; and the areas facing Seto Naikai (Inland Sea).

A check of the annual changes in the amount of precipitation shows that much of the rainfall occurs during the rainy season in June and July and during the long spells of rain in September and October. Occasionally in August, heavy rains also occur on the Pacific Ocean side brought about by thunderstorms and typhoons. The amount of precipitation from snow is extremely great on the Japan Sea side, whereas heavy rainfall is frequently registered in southern Japan in April and May.

Precipitation differs in intensity and its duration varies each time. The daily amount of precipitation exceeding 30 mm conceptually represents a day of much rain in a broad sense. The daily amount of precipitation as well as the hourly amount of precipitation are the elements which must be taken into consideration for city planning and also for designing riparian, civil engineering and construction projects since there is a need for drainage. The daily precipitation for the 10-year return period represents the amount of precipitation which may be expected once every 10 years on the average. On the basis of the data on the amount of precipitation in the past, the return period is calculated by Hazen's equation:  $T_j = \frac{2N}{2j-1}$  (where N is the number of years for statistics, j the ranking integer of the annual maximum daily precipitation amount in the order of the amount beginning with 1 for the greatest, and Tj the empirical return period which corresponds to the precipitation for j).

The 1:8,000,000 scale maps showing the amounts of precipitation were compiled on the basis of the norms registered by climatological stations at 1,200 points all over the country. With respect to Ogasawara Syotō, Habomai Syotō, Kunasiri Tō and Etorohu Tō, the observed values were recorded before 1943 and those for neighboring areas were corrected to esti-

mated norms since the norms for the period from 1941 through 1970 are not available.

Sources

1. Japan Meteorological Agency, The Monthly Normals of Temperature and Precipitation at Climatological Stations in Japan (1941-1970), 1972.
2. Central Meteorological Observatory, Climatic Records of Japan and the Far East Area, 1954.
3. Japan Meteorological Agency, Climatic Table of Japan, Pt. 1, Monthly Normals (1941-1970), 1971.
4. Japan Meteorological Agency, Climatic Table of Japan, Pt. 2, Monthly Normals by Stations (1941-1970), 1972.
5. Japan Meteorological Agency, Climatic Table of Japan, Pt. 3, Extremes and Rankings of Primary Meteorological Elements (first year of observation through 1970), 1972.
6. Japan Meteorological Agency, Climatic Atlas of Japan Vol. 1, 1971.
7. Japan Meteorological Agency, Climatic Atlas of Japan Vol. 2, 1972.

2. Dispersion of Precipitation

There is a wide degree of dispersion of annual changes in the monthly or annual amount of precipitation. To indicate this dispersion, the Japan Meteorological Agency has prepared tables of values for each classification by the quintile grouping method on the basis of statistics covering 30 years.

In the quintile grouping method, the values of samples are put in the order of magnitude and then classified into groups, each constituting one-fifth of the total number. The classifications divided under the quintile grouping formula roughly have the following qualitative implications.

Classification 1: very little, Classification 2: little, Classification 3: moderate, Classification 4: heavy, Classification 5: very heavy.

As regards the question of what classification the amount of precipitation in a given month (or year) belongs to under the quintile grouping formula, the probability theoretically stands at 0.2, so that the probability for Classifications 2 to 4 is 0.6.

The maps were prepared to indicate the range of precipitation for each point, while the value gained by deducting the borderline value between Classifications 2 and 1 from the borderline value between Classifications 5 and 4—i.e., the range of Classification 2, 3 and 4 (range of appearance)—was looked upon as the range of precipitation. The isolines were indicated, while the difference between the maximum and minimum values—i.e., the ratio of appearance of Classifications 2, 3 and 4 to the ratio of appearance of all classification—was looked upon as the ratio of dispersion.

For example, when the range of precipitation and the ratio of dispersion are calculated from the amount of precipitation in Owase covering 30 years, they are 90 mm and 23% in January and 490 mm and 44% in June, respectively.

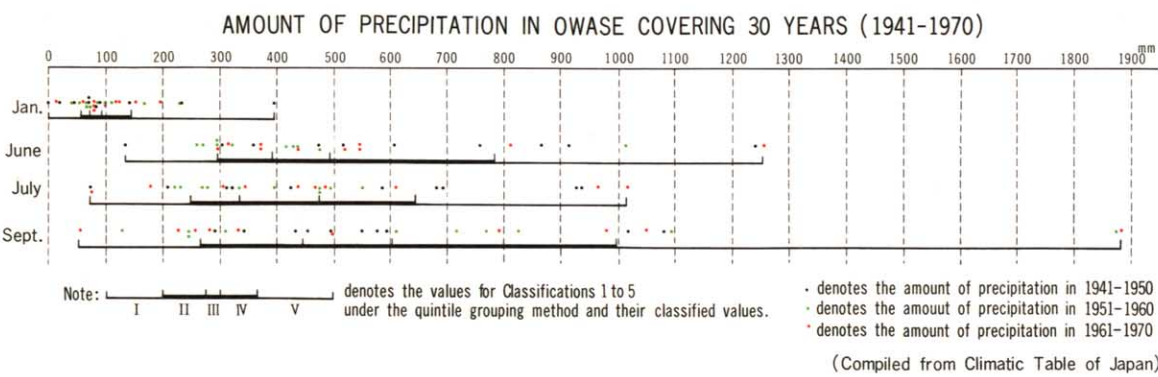
By region, the greater the amount of precipitation, the larger the range of precipitation. By month, the range of precipitation is larger in a month which

has a greater amount of precipitation. Even at the points which have similar amounts of precipitation, the range of precipitation differs to a considerable degree, depending on the point.

That the ratio of dispersion is small (20-30%) suggests the possible appearance of a year registering an amount of precipitation 3.5-5 times the value of Classifications 2 to 4. In such districts, there may be years with a very large or a small amount of precipitation.

Sources

1. Japan Meteorological Agency, Climatic Table of Japan, Pt. 1, Monthly Normals (1941-1970), 1972.
2. Japan Meteorological Agency, Climatic Table of Japan, Pt. 2, Monthly Normals by Stations (1941-1970), 1972.
3. Central Meteorological Observatory, Climatic Records of Japan and the Far East Area, 1954.
4. Japan Meteorological Agency, Climatic Records of Japan (1951-1960), 1969.
5. Japan Meteorological Agency, Climatic Records of Japan (1961-1970), 1972.



QUINTILE GROUPING OF MONTHLY PRECIPITATION AT OWASE (Unit:mm)

	No. I	No. II	No. III	No. IV	No. V
January	1-55	55-71	71-93	93-145	145-389
June	133-294	294-391	391-494	494-784	784-1,254
July	72-248	248-334	334-478	478-644	644-1,013
September	51-265	265-441	441-601	601-997	997-1,883

(Compiled from Climatic Table of Japan)

