

On the break in the Mongolian rainy season

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[1. Introduction]

Mongolia is located in the vegetation transition zone, and the vegetation ranges from tiga forest in the north to desert in the south. Rainfall in warm season is related to these vegetation type and vegetation activity greatly (Miyazaki et al. 2004). Investigation on an interannual and seasonal variability of rainfall over Mongolia is important to understand the vegetation dynamics.

There is a large variation among localities and from one year to another, as far as rainfall is concerned. Hilbig (1995) introduced a large interannual variation of rainfall in semi-arid/arid region. Peter et al. (1999) pointed out that rainfall exhibited short-term variation with 2, 5-6 and 11 years, and drought years are closely associated with the sun's activity. As to the seasonal variation in Mongolia, it is written in many textbooks that there is much rainfall in summer. However, there are few investigations on the seasonal variation of rainfall.

We will report that there is a phenomenon regarded as a break of the Mongolian rainy season using 10-day rainfall data for 9 years.

[2. Data and method]

We use a surface meteorological data set provided by Institute of Meteorology and Hydology, Mongolia. This data set contains 3-hourly air temperature, ground temperature, pressure, humidity, wind, and 12-hourly precipitation from 1993 to 2001. Since there are more than a few missing values in the data set, precipitation data were screened with the following criteria.

- 1) Data of the year that contained missing values more than 5 times from May to September are not used.
- 2) The meteorological stations that have data less than 6 years are not used.

92 stations passed the screening, and 12-hourly precipitation were converted to 10-day rainfall amount.

[3. Results]

Seasonal change of mean 10-day rainfall of 92 stations for 9 years exhibits weak dual maximum at the end of June (1st. maximum) and the beginning of August (2nd. maximum), and minimum at the middle of July. In this study, this minimum is called as a break in rainy season.

The break in the rainy season is recognized in 38 stations (41 %), and 29 stations (78 %) are distributed in the eastern Mongolia among them. The break occurred in the middle of July at 27 stations (73 %) and 2nd. maximum occurred in the beginning of August at 25 stations (68 %).

Mean 10-day rainfall in the break decreases to 3-6 mm/10days in the southern Mongolia (desert steppe and desert). Even if in the break, considerable rain of 15-20 mm/10days are recorded in northern Mongolia (forest steppe and steppe). The break tends to be distinct in the semi-arid/arid region of the eastern Mongolia.

A break of rainy season is a very basic feature. The existence of the break would have been overlooked, because the period of a break of Mongolian rainy season is not so long and the previous climatological studies had used monthly rainfall data.