Long-term Variation of Freezing Climate of Seoul and Han River, Korea

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This study analyzed the long-term variation of the freezing climate of Seoul, Korea, from 1907 to 2006 (100-year period). Data about freezing events and temperature of Seoul were obtained from Seoul observational station (station number: 47108, 37°55′N, 126°57′E). Data about freezing events of Han River (near Seoul meteorological station, 37°34′N, 126°58′E) were compared with these data. Strong correlations were found between the freezing events and the subzero temperatures at Seoul observational station on the first freezing date, last freezing date, and freezing period. However, although Seoul and Han River are very close to each other, different freezing characteristics were observed at these locations.

The first freezing date (freezing period) of Seoul and Han River is October 21 (113 days) and December 30 (51 days) on average, respectively. These first freezing dates exhibited delaying rates of 7.82 days/100 years and 34.66 days/100 years, respectively. In particular, the freezing period decreased remarkably after 1960. During this period, Han River did not freeze for the following seven years: 1960, 1971, 1972, 1978, 1988, 1991, and 2006.

On average, the freezing in Seoul occurred in 6 following days after the first day of subzero temperature in daily minimum temperature. However, the freezing of Han River was not related to the occurrence of subzero temperatures. In this case, other factors such as ground heat and water pollution were suspected as other causes.

Keywords: Freezing period, first freezing date, daily minimum temperature