

30-YEAR CLIMATOLOGY OBSERVED AT KING SEJONG STATION, ANTARCTICA

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ABSTRACT

King Sejong Station (KSJ) is located on the King George Island, north off the Antarctic Peninsula at about 62.23S, 58.79W. Because KSJ is located at polar front zone, the station experiences frequent passage of cyclonic systems with very strong wind and overcast sky. Variation of surrounding large-scale circulations might affect polar front then weather conditions observed at KSJ. In that respect, KSJ offers a good opportunity to monitor atmospheric activity of Antarctica.

Regular meteorological observation has been made at KSJ (WMO Index No. 89251) since February 1988 to provide weather information for field activities as well as to study Antarctic climate. While the meteorological data has served well enough for station operation, the 30-year data from 1988 to 2017 inevitably contains some erroneous values due to sensor or system failure. There is also human errors in observations of cloud, weather phenomenon, snow etc. as well. Recognizing these kind of errors, we have carried out thorough quality control on the 10-minute raw AMOS (Automatic Meteorological Observation System) data to filter out doubtful values. Then daily statistics of AMOS data were compared to monthly weather reports (MWR) which were compiled by a meteorologist in each year. From this comparison, we could detect some additional erratic values in AMOS and/or MWR and correct as possible.

Using the quality-controlled meteorological data, we have studied various climatology of variables such as air temperature, wind, atmospheric pressure, precipitation, snow, solar radiation, cloud amount at the King Sejong Station. From 30-year data, mean annual temperature is -1.7 °C, wind speed is 8.0 m/s, sea level pressure is 990.5 hPa. Interestingly, it was found that annual temperature recovered warming trend since 2010 contrary to cooling trend between 1999 and 2010. It was also noted that mean wind speed showed weakening trend since 2010 and cloud amount showed increasing trend.

In the presentation, mean and extreme values will be given for other variables. In addition, seasonal and monthly statistics will be presented.

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Session 19

Tropical-Polar teleconnection and Antarctic climate change 🔍

Co-conveners: Seong-Joong Kim ✉, Sheeba Nettukandy Chenoli ✉, Rui Mao ✉, Takashi Yamanouchi ✉

Teleconnections between the polar and the tropical climate describes the influence of the tropics on the higher latitudes and vice versa. Teleconnections are prominent features and modulators characterizing daily-to-decadal climate variability in the tropics and high-latitudes. Under the present scenario of a rapidly warming world, it is becoming increasingly urgent to understand the dynamics of the polar atmosphere-ocean-sea ice system and the mechanisms that connect the tropics with polar regions. A key aim of the session is to provide a venue to foster discussions and share advancements in teleconnections between the tropical and polar regions on different time scales. This session therefore will showcase the present progress and new ideas on tropical-polar connection, the processes and mechanisms that link the tropics to Antarctica, which are not well understood yet, but are key to the future trajectory of Antarctic climate.

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