

JASMES 北半球積雪面積長期トレンドの再解析

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Reanalysis of the long-term trend of JASMES snow cover extent in the Northern Hemisphere

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JAXA has started to generate climate-related geophysical variables using NASA's optical sensor MODIS data and distribute them to the public through the web site named JAXA Satellite Monitoring for Environmental Studies (JASMES) since 2008. The data period of the snow cover extent (SCE) product has been extended toward the past around 1980's using NOAA/AVHRR radiance data. The long-term SCE product was re-analyzed this year (JFY2015) and its accuracies were re-evaluated using in-situ measured snow depth data taken from Global Historical Climatology Network Daily (GHCND) data. The results re-confirmed that SCE in the northern hemisphere during 36 years from 1979 to 2014 exhibit negative trends in all seasons during the past 35 years, particularly for summer and autumn (Fig.1). The sign of the summer SCE trend is basically consistent with that of the NOAA/NCDC Climate Data Record of Snow Cover Extent (SCE) products (ver.4). However, the rate of the SCE decrease is not so significant as shown in the NOAA SCE products. In addition, the derived autumn SCE trend is completely different from that of NOAA product, which suggests the occurrence of temporal shift of detection accuracy in the NOAA chart. The user's accuracies of wet snow cover detection were improved from 0.38 to 0.66 after the re-evaluation. Long-term trend of annual snow cover duration period was also re-evaluated. Although the SCE trends are negative in all seasons, spatial pattern of the trend of snow cover duration period are spatially non-uniform. That is, strong negative trends were seen at the western Eurasian continent while positive trends were found at western Canada. This suggests that the effects of the global warming emerges differently from space to space.

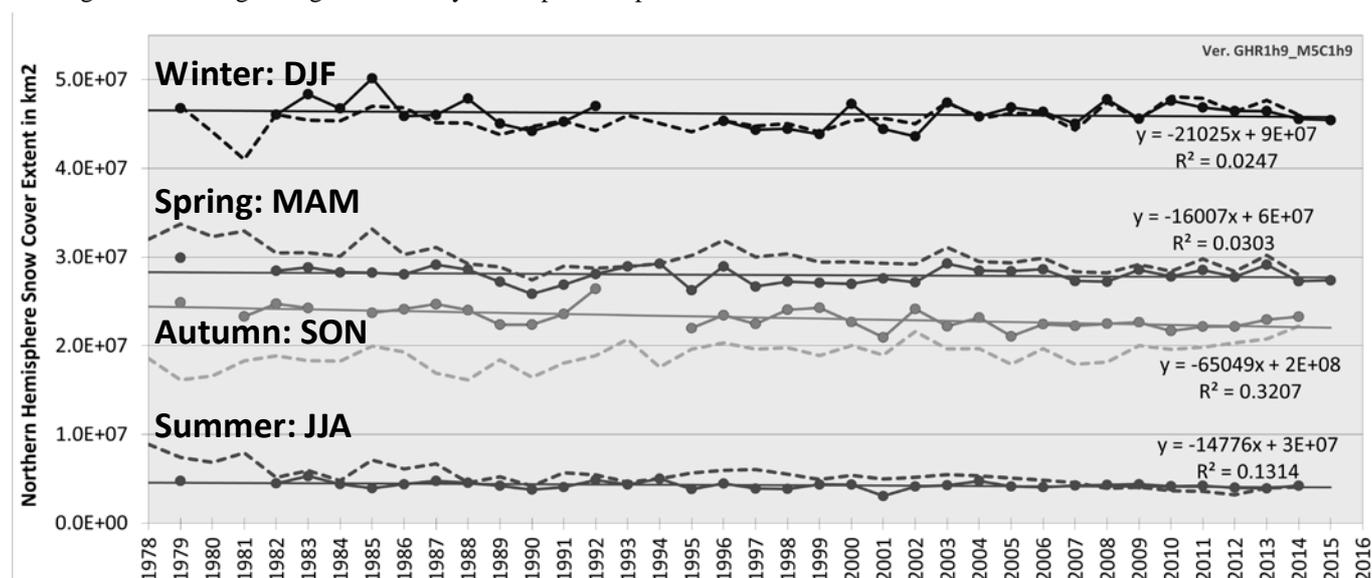


Figure 1. 36-year trend of seasonal snow cover extent in the northern hemisphere (solid line: JASMES SCE, broken line: NOAA SCE)