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Changes in Arctic Diurnal Range Land-Surface Temperature Derived by NASA MODIS-Terra and -Aqua 2000 through 2012

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The diurnal variation of surface temperature is a fundamental parameter as it is a driver of physical processes of atmosphere-land and -ocean energy and mass cycles playing a key role in meteorology and climatology. Our investigation focus is on the diurnal variation of land-surface temperature derived by the Moderate Resolution Imaging Spectroradiometer (MODIS) deployed on the NASA Terra and Aqua satellites. We key our investigation on the ascending and descending mode equator crossing times for daytime and nighttime land-surface temperature variations from March 2000 through 2010 (MODIS-Terra) and July 2002 through 2012 (MODIS-Aqua) and assess the diurnal land-surface temperature range changes at those sampling times. Our investigation shows non-stationary changes in land-surface temperature diurnal range. We identify changes in the diurnal range linked to increase of daytime and nighttime land-surface temperatures from March 2000 through 2010 and decrease in daytime and nighttime land-surface temperatures from July 2002 through 2012. The most recent decrease in daytime and nighttime land-surface temperatures and diurnal range will affect Arctic and other associated energy and mass cycles.
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