

Environmental changes in the cryosphere using satellite gravity observation

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This study introduces cryospheric fluctuations in the polar regions. Winter warming and pressure increase were focused as they affect on the ice sheet temperature, snow accumulation over the Antarctica.

Atmospheric pressure decreases in spring and autumn, increases in summer and winter in the Antarctic. This seasonal variation has been called semiannual oscillation, and it can be observed various atmospheric components. However, cryospheric influence was little known. Recent observation revealed the temperature and snow accumulations over the ice sheet increases in winter due to warm and moist air advection by blocking in winter. Air mass and vapor were transported to the higher latitudes. Snow accumulation was expected when the vapor converged. Reanalysis data and field weather monitoring stations data are available for large scale circulation pattern and snow depth change at the points, but spatial and temporal variations of snow deposit over ice sheet was hardly observed. Although recent development of the reanalysis data can indicate relative intensity and period of snow accumulation, absolute estimation may be improved. New satellite observation techniques of precise gravity measurement are expected to provide available data for ice sheet changes.