AOGS 2005

Proxy PDO signals and recent anthropogeinic impact reconstructed from Kamchatkan glacier

TAKAYUKI SHIRAIWA
Institute of Low Temperature Science, Hokkaido University

Cryosphere in Kamchatka Peninsula, Russian Far East, has been deteriorating since the end of 19th century. This is evident from various proxy climate records such as changes in mass balances and areas of glaciers, ice-core signals and tree-ring width chronologies. An upper 100 m of 212 m-ice core recovered from a crater glacier covering the summit of Ushkovsky Volcano (3902 m a.s.l.) showed 170 years of climate and atmospheric histories. There has been enrichment of stable oxygen isotopes by an amount of 0.8 per mil from the 19th to the 20th centuries. Fluctuations of the net accumulation rate and the average annual stable oxygen isotope revealed decadal to interdecadal oscillations. The two signals showed anti-correlation with so-called Pacific Decadal Oscillations (PDO) Index, showing that positive PDO is associated with low snow accumulation and depleted stable oxygen isotope in Kamchatka. The cross Pacific PDO impacts were also detected in the net accumulation time-series in ice core which we recently obtained at King Col, Mount Logan, Canada. Nitrate ion has been increasing since the end of the 19th century by approximately 100 ppb, which implies the impact of accelerated human impacts on the atmosphere.