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# Multi-Satellite and Sensor Derived Trends and Variation of Snow Water Equivalent on the High-Latitudes of the Northern Hemisphere: Implications for Permafrost Biosequestration Stability

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Permafrost biosequestration regions are affected by changes in land-surface temperature and snow cover. We investigate trends and variations of snow water equivalent derived from more than 30 years of satellite-microwave sensors. Our focus is on snow water equivalent patterns on the high-latitudes of the northern hemisphere co-located to elevation. Low-elevation tundra regions encircling the Arctic show high statistically significant trends of SWE. From Arctic Siberia and Far East Russia through North America and northern Greenland we find increasing trends of snow water equivalent with local region variations in strength. Interestingly across the high Arctic of western Russia through Norway we find decreasing trends of snow water equivalent of varying strength. Power density spectra identify significant power at quasi-biennial and associated lunar nodal cycles. These cycles of the upper atmosphere circulation, ENSO and ocean circulation perturbations from tides forms the causative linkage between increasing snow water equivalent on low-elevation tundra landscapes and decreasing coastal sea ice cover as part of the Arctic system energy and mass cycles.

Reference: R.R. Muskett (2012) Multi-Satellite and Sensor Derived Trends and Variation of Snow Water Equivalent on the High-Latitudes of the Northern Hemisphere, International Journal Geosciences 3(1) (in press Jan. 2012) http://www.scirp.org/Journal/ijg.