The Arctic’s perennial sea ice concentrations from a neural network analysis of SMMR-SSM/I data, 1979–2005

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This data set assimilates measurements from several active and passive microwave satellite sensors and includes a 26-year (1979–2005) record of winter (January - March) daily and monthly multiyear sea ice concentrations, derived from the Nimbus-7 SMMR and DMSP SSM/I brightness temperatures (Gloerson et al 1990; Stroeve et al, 1990) using artificial neural networks (Belchansky et al. 2004, 2005). These networks were learned on the multiyear sea ice concentrations, estimated using the active and passive microwave observations of Russian Okean-01 #7 and #8 satellites (Belchansky and Douglas, 2000) and ERS-1 SAR (Kwok et al, 1990), and synchronous measurements of the brightness temperature from vertically and horizontally polarized 18/19GHz channels and vertically polarized 37GHz channel.

Spatial coverage and resolution of concentration maps are the same, as that of SMMR, SSM/I daily gridded products of the NSIDC (Comiso, 1990). Data are provided in single-byte format in the SSM/I polar stereographic projection with pixel size 25x25 km.

References


Figure on the right side demonstrates winter (January - March) mean MY sea ice concentration maps of Central Arctic, built with neural networks from SMMR-SSM/I data.