Monitoring seasonal standing water over Central Siberia using Ku-band scatterometer data

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Ku-band scatterometer data from the SeaWinds instrument on QuikScat is used to investigate whether it is possible to identify location, duration and extent of seasonal standing water in Central Siberia. The temporal/spatial distribution of seasonal standing water is determined by the freeze-thaw cycles, wetland distribution, soil moisture conditions and annual flooding patterns and is in turn essential for estimating carbon fluxes (methane, carbon dioxide) and for climate change studies. Central Siberia was chosen as study region since it is one of the largest, most important and least monitored biomes in the world, with large implications for global climate change. The excellent temporal sampling rate of the SeaWinds instrument and the different polarization of its two radar beams are used, based on suggestions by Son V. Nghiem from NASA JPL about the capability of the SeaWinds for mapping flooded areas. It is concluded that the potential of polarimetric studies of standing water depends significantly on the extent of water areas inside the satellite footprint, both topsoil moisture and water surfaces having important contributions to the co-polarization ratio. The study of the extent of standing water is complicated by the polarimetric effects observed during snowmelt.