

## **Comparison of active microwave X and C bands for identification of seasonality with respect to longterm monitoring of thaw lakes**

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The Yamal Peninsula in northwestern Siberia is underlain by continuous permafrost and features numerous thaw lakes and river floodplains. Microwave remote sensing has shown to be a suitable method for monitoring landsurface hydrology including thaw lakes. In this study the ability to monitor thaw lake dynamics in different frequency bands and spatial resolutions is investigated. Due to its higher frequency (X band), TerraSAR-X is more sensitive to vegetation structures but its higher resolution (spatial resolution in StripMap mode ~3,5m) allows the detection of even small lakes. It is compared with ENVISAT ASAR operated in WS mode, which, as a result of its lower frequency (C band), penetrates vegetation more deeply, but due to its coarser resolution of 150m is not able to monitor small thaw lakes. In previous investigations strong seasonal dynamics could be shown in this region using ASAR WS. With TerraSAR-X more details on lake margin changes can be shown and by combining data derived with different frequencies (including also L-Band SAR from ALOS PALSAR) aquatic emerging vegetation can be distinguished from open water and shore areas.