Waves in two shallow lakes in different latitudes with climate change perspective – measurements and forecasts

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Abstract:

Mechanical force exerted by waves on the bottom is very important for the correct estimation of resuspension especially in shallow lakes. SMB-equations have been widely used for the wave height, length and period calculations. They form basis for resuspension forcing calculations in many numerical water current and water quality models. The SMB-equations are formed for marine conditions and very few study about their applicability in shallow lake conditions has been reported. We present results from two wave measurement campaigns on Lake Pyhäjärvi in summer 2013. Two different ADCP's with wave sensors were used. Observed data is compared with SMB-results. Data from the two instruments is also compared with each other. Our results show that the wave heights are calculated by SMB-equations in an acceptable way. Still the wave period and thus the wave length is too short as compared to the observations. We will present a modification for the equations for better period calculation. We also study the wind and wave interactions and make forecasts for the future wind development and consequent wave energy distributions.

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