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# Bank Erosion in a Peatland Forest Ditch

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Peatlands have been drained for forestry extensively in Finland since 1950's, but nowadays the drainage is shifted from the initial ditching to the ditch network maintenance, which refers to the cleaning of existing ditches and to the digging of complementary ditches in the drained areas. Ditch maintenance operations lead to sediment load that is considered to be among the most harmful environmental effects of forestry. Excess sediment loads cause adverse effects to the receiving waters and their ecosystems in terms of increased turbidity, which reduces primary production, and siltation, which ruins the spawning grounds of fish. To understand the underlying mechanisms behind the sediment load at the source areas, a field experiment was conducted for studying the bank erosion of a newly cleaned ditch. That was done on a shallow peated area with fine textured mineral subsoil (sandy loam) since such areas are assessed to have the greatest risk for sediment load generation. Bank erosion was quantified by using a pin meter, and its suitability for detecting microtopographic changes of ditch side wall in drained peatland conditions was evaluated. Artificial irrigation was applied in the vicinity of a ditch to generate a seepage face that speeds up the erosion process. The ditch bank microtopography was measured five times for a four meter long section of the ditch by using a large set of pin meter measurements. The measurements from the different times were spatially interpolated over 2 x 2 cm grid using ordinary kriging and erosion and deposition were estimated as the difference in the grid surface between the measurement times. The results revealed that bank erosion occurred soon after the ditch was cleaned, but the eroded material was deposited on the lower bank areas and at the bottom of the ditch where it is potentially transported further during peak discharge events. Pin meter proved to be suitable for measuring bank erosion of peatland forest ditch, although the method turned out to be laborious. The sensitivity of the estimations of eroded material was addressed by systematically sampling different amounts of pin meter data to produce the interpolated surface and by studying the differences in the results.