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Hydrological budget in aqualized peatlands of the James Bay Region (Canada)

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This presentation summarizes the work completed in a number of peatlands of the LaGrande River Watershed, in the James Bay region of Québec, Canada. The objective of the study was to describe the impact of aqualysis (a phenomenon by which the water coverage of peatlands is seen to increase over time). The first component of the study was a comparison of hydrological budgets performed on for two Sphagnum bogs, three patterned fens and two shallow lakes, which represent a gradient of aqualysis from relatively low surface water coverage (bogs) to complete water coverage (shallow lakes). A water budget analysis (precipitation (P), surface runoff (Q), evapotranspiration (ET) and storage variations (ΔS)) was completed between 2005 and 2007. Fens and lakes were more hydrologically similar than bogs, in spite of differences in Q and ΔS variability. The dominant water budget term for bogs, fens and lakes was ΔS, Q and ET, respectively. The second part of the presentation describes a follow up study completed in 2009, focusing on one highly aqualized fen in the same area. P and ET represented almost one third of the hydrological budget each, Q and ΔS changes comprised the other third. Water storage during the summer varied from 1 to 7%, depending on ET estimates. Important sources of uncertainty include peat matrix water storage. This term is considered as the limiting factor for the calculation of accurate water budget in this environment.